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Meadow Restoration, Marys Peak Resource Area
ENVIRONMENTAL ASSESSMENT NO. OR080-03-09

Dear Reviewer,

The Bureau of Land Management, Marys Peak Resource Area, invites you to review the Meadow Restoration Environmental Assessment (EA) and Finding of No Significant Impact (FONSI). This document describes the issues and analyzes the probable impacts from the proposed project. The EA and FONSI are available for review at the Salem District office and on the internet at Salem BLM's website, <http://www.or.blm.gov/salem> (under Planning).

The proposed project locations are as follows:

Project Site Locations

Landmark Name	Legal Location	Watershed	LUA	County	Ac.¹
Lower Mill	T7S-R6W, Sec. 4 & 5	Mill Cr.	AMR, RR	Polk	70
Mid-Mill	T7S-R6W, Sec. 7	Mill Cr.	AMR, RR	Polk	12
Upper Mill	T7S-R7W, Sec. 9	Mill Cr.	AMR, RR	Polk	26
Mill-Cedar	T7S-R7W, Sec. 23	Mill Cr.	AMR, RR	Polk	20
Rickreall	T8S-R6W, Sec. 5	Rickreall Cr.	AMA, RR	Polk	5
Monmouth Peak	T9S-R7W, Sec. 9	Luckiamute River	AMR, RR	Polk	27
Harlan	T12S-R8W, Sec. 7	Big Elk Creek	GFMA, RR	Lincoln	16
Bummer	T14S-R7W, Sec. 31	Upper Alsea River	LSR, RR	Benton	5
East Prairie Mountain	T15S-R7W, Sec. 4	Lake Creek/ Upper Alsea	LSR	Benton	7
Prairie Mountain	T15S-R7W, Sec. 7	Upper Alsea River	LSR, RR	Benton	21
Briar Creek	T15S-R8W, Sec. 6	Lobster Cr.	LSR, RR	Benton	7

¹ Approximate acreage of existing meadow area. Actual treatment areas are larger due to inclusion of meadow perimeter.

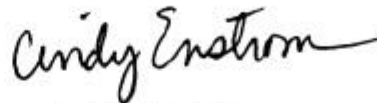
Meadow restoration would occur on a total of up to 324 acres (216 current meadow acres and up to 108 acres of meadow perimeter where conifers have encroached). Proposed methods include conifer removal, Oregon white oak enhancement, native species enhancement, snag creation, and prescribed burning.

The objectives of the project are to restore meadow habitat perimeter, structure, and species composition to conditions believed to have existed during a regime of frequent, low-intensity fire.

We are interested in hearing from you and ask that you provide us with your comments by August 8, 2003. Please respond by then so a final decision can be made on the action. Comments specific to the alternatives and assessment of potential environmental effects would be the most helpful.

If you have questions about the environmental assessment, please call Hugh Snook at (503) 315-5964. Please send your written comments to Field Manager, Marys Peak Resource Area, Salem District Bureau of Land Management, 1717 Fabry Road S.E. Salem, Oregon, 97306.

Sincerely,

A handwritten signature in black ink that reads "Cindy Enstrom". The signature is fluid and cursive, with a long horizontal stroke extending from the end of the name.

Cindy Enstrom
Field Manager
Marys Peak Resource Area

***Note:** Comments, including names and addresses of respondents, will be available for public review at the same time as the EA from 7:30 a.m. to 4:00 p.m, Monday through Friday, except holidays. Individual respondents may request confidentiality. If you wish to withhold your name or street address from public review or from disclosure under the Freedom of Information Act, you must state this prominently at the beginning of your written comment. Such requests will be honored to the extent allowed by law. All submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, will be made available for review in their entirety.

**United States Department of the Interior
Bureau of Land Management
Salem District Office, Marys Peak Resource Area**

**ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT
IMPACT FOR**

**MEADOW RESTORATION PROJECT, MARYS PEAK
RESOURCE AREA**

EA NUMBER : OR-080-03-09

PREPARED BY: Hugh Snook, Team Lead

AREA ENVIRONMENTAL COORDINATOR: Carolyn Sands

SUMMARY: This document is an Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) for a proposed Fiscal Year 2003-2008 meadow restoration project. The purpose of the proposed action is to restore meadow habitat perimeter, structure, and species composition to conditions believed to have existed during a regime of frequent, low-intensity fire. There are multiple project site locations on BLM-managed lands in the Oregon Coast Range in Polk, Lincoln and Benton Counties. Three alternatives are presented.

Alternative 1 is the “No Action” alternative.

Alternative 2, the proposed action. Conifer trees that have become recently established within meadow habitat would be cut, burned or girdled. On some sites, the resulting fuel would be reduced by piling and burning. Oregon white oak associated with dry meadows would be enhanced through release from overtopping conifer, thinning, and planting. Native vegetation abundance and diversity would be enhanced by seeding and planting, and controlling non-native plants. Snags would be created adjacent to meadows to provide wildlife habitat. Prescribed burning would be used where appropriate to remove conifer, enhance native vegetation, reduce fuels, and reduce weeds. The effects on meadow vegetation would be monitored.

Alternative 3. The components of this alternative are the same as Alternative 2, but prescribed (broadcast) burning would not occur. (Piled slash would be burned, as in Alternative 2).

For further information contact:

Hugh Snook, Ecologist, Salem District BLM, 1717 Fabry Rd. SE, Salem, Oregon 97306
Phone# 503-315-5964

Comments regarding this Environment Assessment and the Finding of No Significant Impact should be received by the BLM, Marys Peak Resource Area by August 8, 2003.

FINDING OF NO SIGNIFICANT IMPACT

Introduction

The Bureau of Land Management (BLM), Marys Peak Resource Area has analyzed the potential effects of a project to restore meadow habitat on various locations in the Oregon Coast Range in Polk, Lincoln and Benton Counties. The action described in this environmental assessment (EA) is intended to restore meadow habitat perimeter, structure, and species composition to conditions believed to have existed during a regime of frequent, low-intensity fire.

The action would meet the needs for habitat as identified in the *Salem District Record of Decision and Resource Management Plan (RMP, May 1995; see pp. 1 and 2)*. The EA is attached to and incorporated by reference in this FONSI determination.

This FONSI and the EA are being made available for public review prior to making a decision on the action. The public notice of availability for review will be published in the Dallas, Oregon *Polk County Itemizer-Observer* and the *Corvallis Gazette-Times*, and through notification of interested individuals, organizations, and state and federal agencies. The document will also be available for review on the internet at this address:

<http://www.or.blm.gov/salem> (under Planning).

Finding of No Significant Impact Determination

Based on the analysis of information in this EA, my determination is that a new environmental impact statement or supplement to the existing *FEIS* is unnecessary and will not be prepared. The proposed action would not result in significant environmental impacts affecting the quality of the human environment greater than those addressed in the existing *FEIS*.

Finding Rationale

Under the alternatives analyzed, significant impacts on the quality of the human environment would not occur based on the following criteria:

1. The alternatives are in conformance with the following documents that provide the legal framework for management of BLM lands in the Marys Peak Resource Area:

- *Record of Decision and Standards and Guidelines for Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (January 2001) and the *Final Supplemental Environmental Impact Statement For Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (S&M FSEIS, November 2000).

- *Salem District Record of Decision and Resource Management Plan (RMP, May 1995)*.

- *Salem District Proposed Resource Management Plan/Final Environmental Impact Statement (FEIS, September 1994)*.

- *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl (April 1994) and the Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl (SEIS, February 1994).*

2. The action would be consistent with the Aquatic Conservation Strategy Objectives (See Appendix 2, Aquatic Conservation Strategy Objectives Review Summary).
3. The proposed action and alternatives are in conformance with the *RMP*, which describes the general management objectives, land use allocations, and management actions/direction for BLM-administered lands in the Marys Peak Resource Area
4. The alternatives are consistent with other federal agency and State of Oregon land use plans and with the Polk, Lincoln, and Benton County land use plans and zoning ordinances. Any permits associated with the implementation of this project would be obtained and requirements would be met.
5. There are no flood plains, or prime or unique farmlands within the sale area.
6. No known cultural resources or paleontological resources occur in the project area. The project area occurs in the Coast Range. Survey techniques are based on those described in Appendix D of the *Protocol for Managing Cultural Resource on Lands Administered by the Bureau of Land Management in Oregon*. Post-project surveys will be conducted according to standards based on slope defined in the Protocol appendix. Ground disturbing work will be suspended if cultural material is discovered during project work until an archaeologist can assess its significance. A pre-disturbance survey will be completed prior to hand fireline construction in the Lower Mill project area at the request of the Grand Ronde tribe.
7. The proposed project would not affect suitable habitat for the northern spotted owl or marbled murrelet, and is a “no effect” determination for both of these listed species. Suitable habitat for bald eagle, red tree vole, and Oregon Megomphix snail would not be affected. The Biological Evaluation (June, 2003) for this project is found in the Meadow Restoration EA analysis file. All applicable mitigation measures from the Biological Evaluation have been incorporated into the project design features for this proposed action.
8. Due to the distance to streams, low impact of activities, and buffering of live streams, this project will have no effect on local stream habitat and the aquatic environment. Listed fish will not be affected by the proposed action. The Fish Biologist’s report is in the Meadow Restoration EA analysis file.
9. Some sites within the proposed action are within the coastal zone as defined by the Oregon Coastal Management Program. This proposal is consistent with the objectives of the program and the state planning goals which form the foundation for compliance with the requirements of the Coastal Zone Act. Management actions/direction found in the *RMP* were determined to be consistent with the Oregon Coastal Management Program.
10. No hazardous materials or solid waste would be created in the sale area.

11. The project sites do not qualify for potential wilderness nor have they been nominated for an Area of Critical Environmental Concern.
12. Project design features would assure that potential impacts to water quality would be in compliance with the State of Oregon In-stream Water Quality Standards and thus the Clean Water Act.
13. The smoke generated from prescribed burning would be within the standards set by the Oregon Smoke Management Plan, which considers national air pollution standards and complies with the Clean Air Act.
14. Since this action is proposed for meadow habitat, no stands that are currently late-successional forest would be affected by this action. Therefore, the "15% Analysis" prescribed in the RMP does not apply to this action, nor do requirements for snags and coarse woody debris prescribed for coniferous forest (pp. 21-22),
15. The actions are local in nature and potential adverse impacts would be short-term. Impacts were determined based on research, observation, professional training, and experience by the inter-disciplinary team of natural resource specialists. Determining such environmental effects reduces the uncertainties to a level that does not involve highly unknown or unique risks. The design features identified in the EA would assure that no significant site-specific nor cumulative impacts would occur to the human environment other than those already addressed in the S&M FSEIS, FEIS and SEIS.
16. The purpose of the project and the proposed implementation methods are not likely to be highly controversial. Issues found in the scoping process were local, specific and not controversial; general support was encountered for the project. Similar recent projects within the region have not created high levels of controversy.
17. A decision regarding this project does not establish a precedent for future actions with significant effects or represent a decision in principle about a future consideration. While future management of these and similar sites may be influenced by the results or knowledge gained by this decision, future management actions will undergo separate analyses that include a full range of alternatives.


Marys Peak Field Manager

7/7/03
Date

Comments regarding this environmental assessment should be received by the Bureau of Land Management, Marys Peak Resource Area, by August 8, 2003.

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ENVIRONMENTAL ASSESSMENT

INTRODUCTION

Project Location

Eleven project sites are included, all within the Marys Peak Resource Area of the Salem District BLM, in the Oregon Coast Range. Five project sites are in the Mill Creek drainage, and one each are found in the Rickreall, and Luckiamute drainages, all west of Salem, Oregon. Three are found in the Alsea/Lobster drainages and one in the Big Elk drainage, all southwest of Corvallis, Oregon. Specific locations and maps are found in Chapter II, Alternatives. Project sites total 216 acres of meadow and up to 108 acres of treated perimeter (total up to 324 acres).

Context

The Oregon Coast Range has a landscape matrix of very dense mesic temperate coniferous forest habitat. Non-forest patch habitat occurs in this highly productive forest matrix as a result of natural disturbance (fire, wind throw, debris torrents, insects, disease) or geomorphic features. Landscape patches created by natural disturbance can vary greatly in size but are usually short-term, while geomorphic features usually create small sized but long-term patches (> 100 years) which are maintained, in part, by periodic natural disturbances. Meadows are primarily geomorphic long-term patches of unique or special habitat that bring both plant and animal diversity to the forest matrix of the Oregon Coast Range landscape.

Historically, meadows occupied a much greater proportion of the landscape in the Willamette Valley and foothills, and areas of the Coast Range. Historical accounts and survey records from the General Land Office (1850-1854) describe vegetation conditions in the Coast Range foothills dominated by meadows, Oregon white oak (*Quercus garryana*) savanna and mixed Douglas-fir (*Pseudotsuga menziesii*)/Oregon white oak forests. Watershed Assessments conducted on the Marys Peak Resource Area describe past vegetation conditions that included a greater proportion of meadows and disturbance regimes that maintained them. The Coast Range still contain remnants of meadow and oak habitat, but it is much diminished from the past. Human action, such as fire suppression, agricultural conversion, and grazing has contributed to the decline of meadows and oak woodlands throughout its range. The Nature Conservancy, in a report funded by the Environmental Protection Agency wrote: "For upland communities, greatest losses [of rare plants and animals] have occurred in savanna and dry prairie. The greatest number of rare upland plants and animals occur in these habitats." (Titus, 1996). In turn, the disappearance of these habitats has contributed to declines in native flora and fauna (Chiller et al. 2000, pp. 29-34, 41-45).

Loss of meadow habitat in the Coast Range is primarily due to establishment of conifers. Prior to European settlement, frequent fires, perhaps set by Native Americans, served to maintain open meadows. After settlement, sheepherders may have continued this practice (Brown, 1960). Sheep grazing itself may have limited conifer establishment.

However, it is thought that overgrazing may have eventually diminished the abundance and vigor of herbaceous vegetation, serving to reduce competition for invading conifer. About 1945, sheep grazing was generally eliminated; coinciding with the onset of a 30 year period of cool, wet weather. These events have been correlated with a wave of conifer establishment in montane meadows in Oregon (Vale, 1981). In high elevation grassy “balds” improved conditions for conifer establishment may be due to an increased duration of snow-free growing season (Agee and Smith, 1984 and Butler, 1986), or to suspension of frequent fire and grazing. Since this period of increased conifer encroachment has begun, fire suppression has allowed most conifer to survive and grow, allowing successive waves of conifer regeneration to establish along meadow perimeters, diminishing meadows in size.

A very small amount of meadow habitat occurs on Federal lands in the Coast Range. On the 128,000 acre Marys Peak Resource area of the Salem District BLM, approximately 500 acres, or .4% of the land base contains meadow.

Figure 1. Monmouth Peak Meadow



I. PURPOSE AND NEED

A. Purpose

Meadow habitat has decreased in the Coast Range of Oregon. The purpose of the proposed action is to restore meadow habitat perimeter, structure, and species composition to conditions believed to have existed during a regime of frequent, low-intensity fire.

Specific Objectives are to:

- Restore approximate extent of meadow perimeter to the former extent evident from geomorphologic characteristics, forest stand structure and ground vegetation, by removing conifers that have encroached into meadows in the last 30-50 years.
- Increase the diversity, abundance and distribution of native species within meadows
- Remove competition from Oregon white oak trees on the margins of dry meadows to allow growth of open-crowned trees
- Establish more Oregon white oak trees in margins of meadows after conifer removal
- Use prescribed fire to meet restoration goals where appropriate and feasible
- Increase large snag habitat on the perimeter of meadows to improve wildlife habitat
- Incorporate monitoring into the project design and monitor and learn from the action

B. Need

The need is to restore and maintain special habitats as directed by the *Salem District Record of Decision and Resource Management Plan* (RMP, P. 26) and to carry out recommendations from Marys Peak Resource Area watershed assessments to maintain and restore meadow habitat.

Watershed assessments (WA) conducted in the late 1990's for lands within the Marys Peak Resource Areas have identified several recommendations relating to meadow habitat:

- “*Learn more about the use of prescribed fire to control brushy or competing non-native vegetation species on grassy balds.*” (North Fork Alsea WA, 1996. p. 137)
- “*Prepare a prescribed fire plan for burning...to maintain or create structural diversity and favor open grassland species.*” (Mill/Rickreall/Rowell/Luckiamute WA, 1998. p. IV-9)
- “*Maintain current meadows.*” (Lobster/Five Rivers WA, 1997. p. 96)
- “*Develop or maintain small meadows to increase plant diversity.*” (Upper Siletz WA, 1996. p. 7)

- “Develop or maintain small meadows for use by many species of plants and wildlife.” (South Fork Alsea WA, 1995. p. 38)

Management direction from several sources supports the need:

- 1) The RMP directs that special habitats, (such as oak savanna), be identified and relevant values determined for protection or management. It also directs that management practices, including fire, be used to obtain desired vegetation conditions in special habitats (p.26).
- 2) The RMP directs that wildlife habitat be managed to maintain and enhance biological diversity and ecosystem health (p.24).
- 3) Most of the project sites are within the North Coast Adaptive Management Area, established in the *Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl* (known as the Northwest Forest Plan, USDA, USDI, 1994) for the specific purpose of “restoration and maintenance of late-successional forest, conservation of fisheries habitat and biological diversity. The specific Adaptive Management Area objective targeted in the proposed action is to test a new approach to restoring special habitat that may help to maintain biological diversity.
- 4) Management actions/Direction given for special habitats in Appendix B1 (Revised Preferred Alternative for Western Oregon BLM) of the Northwest Forest Plan (USDA, USDI, 1994), is to “Use silvicultural prescriptions and prescribed fire to manage special habitats such as oak woodlands, prairies, meadows, marshes and grassy balds to prevent encroachment of dense underbrush, shade-tolerant conifers and other species not naturally found in these plant communities under more natural fire conditions.” (page B-11).

C. Land Use Plan Conformance

This project conforms with the following documents:

The (RMP/FEIS) *Salem District Proposed Resource Management Plan/Final Environmental Impact Statement*, September 1994, and Record of Decision (ROD) May, 1995: Alternatives presented within this EA describe activities that are in compliance with the RMP and ROD. However, because the project area has been identified as a special habitat, management direction that pertains to development of late-successional and old-growth conifer forest habitat is not applicable, such as standards for coarse woody debris and snags (RMP pp. 20 and 21). (Rationale appears in Chapter 2, Alternatives).

(SEIS/ROD) *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl and Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl*, April 1994. The RMP was designed to be consistent with the SEIS/ROD and incorporated the analysis in the SEIS (RMP p.3).

(SEIS) *Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl*, February 1994.

Record of Decision and Standards and Guidelines for Amendment to the Survey & Manage Protection Buffer, and other Mitigation Measures Standards and Guidelines (S&M ROD, January 2001) and the *Final Supplemental Environmental Impact Statement For Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Standards and Guidelines* (S&M FSEIS, November 2000), as amended by Table 1-1 (March 14, 2003 BLM Instruction Memorandum No. 2003-050).

Western Oregon Program-management of Competing Vegetation Final Environmental Impact Statement, VMFEIS (February 1989) and the *Western Oregon Program-Management of Competing Vegetation Record of Decision* (August 1992).

Northwest Area Noxious Weed Control Program Final EIS (USDI, 1985) and the associated *Record of Decision* (USDI, April 7, 1986), and the *Supplement to the Northwest Area Noxious Weed Control Program* (USDI, March 1987) and its associated *Record of Decision* (May 5, 1987).

D. Issues

The following issues were identified through internal scoping that could not be mitigated through project design and therefore an alternative to the Proposed Action was developed:

1. Prescribed (broadcast) burning carries some risk of escape to adjacent private lands and risk of damage to the buildings and communication equipment found on three of the project sites.
2. Prescribed burning may adversely affect air quality.

The following concerns surfaced from internal and external scoping. None of them developed into significant issues that drove development of alternatives to address them, but were a basis for mitigation and evaluating effects.

1. Uncontrolled vehicle access at Prairie Mountain may be contributing to soil and vegetation damage from off-road vehicle use.
2. There is a slight potential for this project to impede and/or prevent attainment of the stream flow and basin hydrology, channel function, or water quality objectives of the Aquatic Conservation Strategy.
3. The project could affect resident and anadromous fish and the aquatic habit.
4. The project could affect long-term soil productivity.
5. Tree removal will create fuels; the amount of fuels and the effects of treating them could impact soil and vegetation.



Fig. 2. Tree encroachment, Monmouth Peak

II. ALTERNATIVES, INCLUDING THE PROPOSED ACTION

A. Alternative One- No Action

The no action alternative proposes no changes to the current condition at this time - no action would take place. This alternative serves as a baseline from which to understand the changes associated with the action alternative.

B. Alternative Two: Proposed Action

The proposed action is to cut or girdle conifer trees that have encroached into meadow habitat; potentially remove a limited amount of larger cut trees for fish habitat improvement; improve vigor and distribution of Oregon white oak trees associated with dry meadows by conifer removal, oak thinning and oak planting; prepare sites and plant or seed native species of forbs and grasses, create snag habitat adjacent to meadows; and use prescribed fire where appropriate to aid in these actions.

Table 1. Components of the proposed Action

Component	Conifer Removal	Oak Enhancement	Native Species Enhancement	Snag Habitat Creation
Where (within interior and perimeter of project areas)	Trees established in meadow and 250' (average distance) perimeter in the last 30-50 years.	Existing oak under competition, and areas suitable for oak establishment.	Where native species diversity and distribution has been limited by non-native or invasive species.	Within 200' of meadow perimeters where existing snags >24" dbh number < 1 per acre (of meadow).
How	Cut, girdle, or burn conifer. In general, cut trees < 9" dbh, girdle/leave standing trees 9-20". Use prescribed fire where appropriate to kill trees.	Cut or girdle and leave standing conifer over-topping oak trees, thin dense oak clumps, plant oak in conifer removal zone.	Seeding and/or planting of native forbs and grasses. Prescribed fire used where appropriate and efficient. Manual control of non-native species.	Girdling trees > 20" dbh. Snags may be grouped or single. Trees may be selected for girdling that also meet oak release or meadow perimeter increase objectives.
Why	To restore meadow habitat to open, non-forested condition.	To restore oak fringe to dry meadows where it formerly was predominant.	To re-establish native species to former range, increase their vigor, diversity, and abundance.	To provide snag habitat adjacent to meadow habitat to increase potential wildlife use of both components.
When	2003+ Cutting 2004+ Burning	2003+ Release 2005+ Planting	2004+ Seeding 2004+ Burning	2003, 2004, 2005

Table 2. Proposed Action Locations

Site	Ac ¹	Conifer Removal ²	Prescribed (Broadcast) Burning	Oak Enhancement	Native Species Enhancement	Snag Habitat Creation
Lower Mill	70	Many	Portion	Yes	Yes	Yes
Mid-Mill	12	Few	No	Yes	Yes	Yes
Upper Mill	26	Many	No	Yes	Yes	Yes
Mill-Cedar	20	Many	Portion	Yes	Yes	Yes
Rickreall	5	Few	Portion	Yes	Yes	Yes
Monmouth Peak	27	Many	Yes	No	Yes	Yes/ Limited
Harlan	16	Many	No	No	Yes	Yes
Bummer	5	Few	No	Yes	Yes	Yes
East Prairie Mtn.	7	Very Few	Yes	No	Yes	Yes
Prairie Mtn	21	Many	Yes	No	Yes	Yes
Briar Creek	7	Few	No	No	Yes	Yes

¹ Existing meadow acres only; project area includes area of conifer encroachment in addition. See Affected Environment, Ch. 3.

² Conifer Removal:

Few = less than 500 trees to be removed within 250' perimeter of meadow edge.

Many = more than 500 trees to be removed within 250' perimeter of meadow edge

1. Components of the Proposed Action

Conifer Removal

Conifer would be removed from the interior of meadows, including the meadow perimeter 0-500 feet (average about 250 feet distance) back from the existing meadow edge. The extent of conifer removal would be based on biotic and geological features that indicate past meadow extent. Aerial photos (c.1956) and past studies (Aldrich, 1972) would also be used to help define encroachment. Conifer that occurs within meadows and meadow perimeter would be removed through a combination of cutting and girdling, and in some sites, by prescribed fire. Conifer less than or equal to 9 inches diameter at breast height (dbh) are most numerous, and in general, would be removed by cutting. Trees between 9 inches and 20 inches would generally be girdled and left standing. Fuels resulting from conifer cutting would be piled by hand, covered with plastic and burned under favorable smoke dispersal conditions in the fall, in compliance with the State smoke management plan. Areas of light or scattered fuels would be treated by lopping and scattering (severing limbs and bucking bole and scattering pieces). At the Monmouth Peak and Prairie Mountain sites, an opportunity exists to donate felled trees greater than 9" dbh for in-stream fish habitat enhancement work, using a helicopter to remove and directly place them in nearby streams.

Prescribed (Broadcast) Burning

Prescribed broadcast burning would be applied to three sites, and portions of another three sites. These areas total about 55 acres of present meadow, and approximately 20 acres of cleared perimeter area. Burning would be used in place of cutting and girdling to reduce conifer, or following conifer removal and fuel disposal. In the latter case, conifer that could be more efficiently killed by burning would not be cut. Burning would be

applied to the meadow and the meadow perimeter. The perimeter would range from 0-500 feet from the existing meadow edge and would be based on biotic and geological features that indicate past meadow extent.

Burning would be conducted in Spring or Fall during periods of vegetation dormancy. The range of weather and fuel conditions prescribed would be for a fire intensity sufficient to cause mortality of as many of the target trees as practical given the available fuels, holding conditions and resources at risk. This may be as high as 90% of trees <5" dbh, and 50% of trees from 5" to 10" dbh. It is likely that considerably less of the larger trees could be killed with out incurring undue holding risk. Flame lengths would be in the range of 1-4 feet in meadow vegetation, and need to be 3-8 feet under the larger timber to achieve the desired mortality rates. In most of the timbered areas, the light fuel loading will not support this level of fire intensity under favorable weather conditions so mechanical girdling will probably be used more than fire for this purpose.

Prescribed fire would be repeated at intervals of 5-10 years following initial burning to maintain the meadows. Ignition method would consist of driptorches, fusees, or aerial ignition (helicopter application of 'ping-pong balls' of potassium permanganate/ethylene glycol mix).

c. Oak Enhancement

Oregon white oak occurs in several project sites (Table 2). Where oak are found at the margins of meadows, they are often overtopped or crowded by encroaching conifer. In some areas, groves of oak are growing at high density that precludes full crown development. Where appropriate, conifer overtopping oak would be girdled, contributing to snag habitat. Groves of dense oak would be thinned to a spacing equal to dominant oak tree height. Following conifer removal and prescribed fire, oak seedlings would be planted in small areas of the meadow perimeter to increase the hardwood wildlife component.

d. Native Species Enhancement

A variety of non-native grass, shrub and forb species can be found in the project sites. Native species distribution and condition could be improved at some locations by seeding or planting of native grasses, forbs or shrubs and control of non-native plants. Damage to soil and vegetation at Prairie Mountain, resulting from off-road vehicle use, could be prevented by controlling access.

e. Snag Habitat Creation and Coarse Woody Debris

Within 250 feet of meadow perimeters where existing snags greater than 24" dbh number less than one per acre of meadow, snag habitat would be increased by girdling trees. Wherever possible, snags should be created at each meadow site by girdling Douglas-fir trees 24 inches DBH or greater, however they would range in size from 9" to 30" dbh. Snags would be clumped rather than scattered. Trees to be girdled would be sited to receive the most solar heating possible. The number of snags to be created at each

meadow will depend on the availability of larger trees in the right location (along the northern edge of the meadow). Trees which have active red tree vole nests or are potential nest trees for spotted owls or marbled murrelets will not be selected for girdling.

RMP direction for CWD levels was developed for management of the coniferous forest ecosystem and does not apply, ecologically, to restoration of meadow habitat. While special habitats and associated management are addressed in the RMP, the variety of conditions found in the “special habitats” preclude specific management direction for CWD and snag levels. Because meadows form such a small part of the land base, the cumulative effect of not retaining CWD in them is not significant. Meadows are, almost by definition, without trees, and therefore without CWD. Oak woodlands surveyed on the Eugene District BLM were found to have low levels of snags (Chiller, et al, 2000), and under the frequent fire regime that historically occurred in meadow and oak woodlands (Agee, 1993), CWD would have been uncommon.

Similarly, snag levels prescribed in the RMP for coniferous forest (40% population potential of cavity nesters) do not apply non-forested portions of the project area. However, snag habitat in the matrix surrounding meadow habitat will be increased through the proposed action.

Table 3. Project Design Features (listed by Components of the Proposed Action)

<i>CONIFER REMOVAL, OAK ENHANCEMENT and SNAG CREATION</i>
A 10 foot uncut stream buffer would be left on each side of any running or standing water. Slash piles will be located outside of the 10 foot stream protection zone and away from standing or running surface water.
If firewood or post/pole material is present on roadside after completion of the cutting contract, permits may be made available to the public.
Trees would be retained that have evidence of wildlife use or that were established well before recent meadow encroachment
Hardwood tree species would be retained.
Because affected environment is not habitat for old-growth forest associated species protected under the Survey and Manage requirements of the Northwest Forest Plan, no pre-disturbance surveys for survey and manage species are planned for this action (<i>S&M ROD</i> , January 2001 and the <i>S&M FSEIS</i> , November 2000 and 2002 Annual Species Review Table 1-1, (March, 2003). Management of any Survey and Manage Species found on project sites would be accomplished in accordance with the above direction.
Treatment operations would be conducted in conformance with the applicable Biological Evaluation (# OR080 – 03-09) concerning listed wildlife species. .
Notify the Resource Area Biologist if any federally listed wildlife species are found occupying stands proposed for treatment.
Conifer greater than or equal to 20 inches DBH within treatment areas will be surveyed for active red tree vole nests and potential nesting habitat for northern spotted owls and marbled murrelets. Trees with active red tree vole nests or that provide northern spotted owl or marbled murrelet potential nesting structure will not be cut or killed by burning or girdling.
Noise disturbance to breeding owls or murrelets in adjacent unsurveyed suitable habitat will be avoided by restricting equipment use between March 1 and September 30
Snags will be located away from roads and communication site improvements

Table 3. Project Design Features , continued.

<i>TREATMENT OF FUELS RESULTING FROM CONIFER REMOVAL</i>
Cut trees would be lopped & scattered or accumulations may be piled & burned, determined on a site by site basis.
Where conifers are lopped and scattered adjacent to roads, all limbs should be scattered at least 20 feet away from the road to minimize fire risk.
Slash piles would be located to prevent damage to soil and adjacent trees from burning operations. Slash piles on the dry meadow sites would be less than 5 feet in height and kept to less than 50 ft ² of ground area coverage to minimize negative impacts to the thin soils from burning.
Slash would be pulled back 10 feet from the edges of all roads and to the top of all road cut banks.
If necessary, cutting and girdling would be timed to avoid creating large concentrations of fuel at one time, by spreading it over a period of several years.
Helicopter removal: No landings would be used on-site. Helicopter re-fueling would take place at a location secured by the log donation recipient, conforming to all required standards.
Piles would have 75% coverage with 6 mil plastic to allow burning under wet Fall conditions.
<i>PRESCRIBED (BROADCAST) BURNING</i>
No ignition or refueling of torches would occur within a 10 foot of any running or standing water.
Prescribed burning would be conducted in accordance with site specific prescribed burn plans that conform to current standards, direction, and regulations. Burning would be conducted under “good mixing” weather conditions in compliance with State Smoke Management instructions.
Adjacent landowners will be notified in advance of prescribed burning.
Control lines would consist of natural features, areas of light fuel, roads and hand fire lines. Mowing and foam or sprinkler lines may also be used for fire lines in light fuels. To protect structures or other features, fuel pull back or removal, foam, sprinklers or heat-deflecting fire shelters would be used.
Burning would generally occur in mid-October to mid-November for piled material and mid-Winter to early Spring or late September through October for broadcast burning.
If needed, class A (detergent based) foam that does not contain fire retardant would be used.
Areas dominated by red alder and bigleaf maple areas would not be burned. Streams that have well developed conifer dominated riparian reserves would be protected.
No known cultural or paleontological resources occur in the project area. If any sites are identified during implementation, the operations would be immediately halted and the Field Manager would be notified. Operations would be resumed only with the Field Manager’s approval, and only after appropriate mitigation measures were designed and implemented to provide any needed protection of those resources. A cultural resource survey would be conducted prior along planned fireline construction in the Lower Mill site (T. 7 S., R.6W., sec. 4 and 5), prior to construction, at the request of Grand Ronde Tribal Government..
<i>NATIVE SPECIES ENHANCEMENT</i>
Enhancement activities on each project site would be based on field surveys that assess condition and relative abundance of native species.
Native seed or plants used would be from the same elevation zone and province as the recipient site.
Non-native species would be controlled by manual methods (cutting, grubbing, or pulling) or burning.
Native species would only be seeded or planted in project sites where they already occur (to increase abundance), or where they occur in similar habitat within the province.
The BLM would coordinate with adjacent landowners and authorized users of the Prairie Mountain communication sites to reduce current off-road vehicle use damage on BLM-managed land. This would likely result in the existing gate on the site being locked. Boulders or other natural barriers could be placed to prevent localized damage. Rehabilitation of existing damage would occur.

f. Monitoring Plan

Under the Salem District RMP, a representative sample of each project type is selected for monitoring project implementation for conformance with the RMP. This proposed project may or may not be selected for such monitoring.

Effectiveness and validation monitoring will occur in selected locations, using sampling transects and photo points. Vegetation species, height, and percent cover will be collected along sampling transects before and after treatments. This information will be used to evaluate treatments, determine additional treatment needs, and to develop future restoration projects.



Figure 3. Bummer Creek Meadow

C. Alternative Three: Restoration without Prescribed Broadcast Burning

This alternative was developed to analyze the effectiveness of meeting the purpose and need without the use of prescribed fire.

a. Conifer Removal

Same design features as Alternative 2, Proposed Action. However, since no conifer removal would occur from prescribed burning, more cutting and girdling would be utilized under this alternative to remove conifers. Design features are the same as listed for Alternative 2.

b. Prescribed Burning

About 55 acres of meadow appropriate for prescribed broadcast burning would not occur under this alternative. Disposal of slash piles by burning would occur.

c. Native Species Enhancement

Same as Alternative 2, Proposed Action, but site preparation and control of non-native species would not occur from prescribed burning.

d. Oak Enhancement, Snag Habitat Creation, and Monitoring

Same as Alternative 2, Proposed Action.

D. Alternatives Considered Eliminated From Further Analysis

1. *Cutting and removing merchantable trees through commercial timber sales to reduce conifer encroachment.* Some encroaching trees are merchantable, and commercial removal would fully meet the purpose and need while maintaining low fuel loadings. However, this Alternative is not analyzed because it would be much more efficient and economically feasible to do commercially harvest these relatively small, scattered areas in conjunction with larger adjacent timber sales. As future timber sales are planned, opportunities to restore meadow perimeter will be considered.
2. *Removing only conifer less than seven inches dbh.* This option was considered, to reduce fuel creation. Many larger trees are affecting meadow habitat, and the purpose and need could not be met without removing at least a portion of them

III. DESCRIPTION OF AFFECTED ENVIRONMENT

A. Introduction

This section describes the environmental features affected by the proposed action or the alternatives. Resource values are not described in this section if there are no anticipated site-specific impacts, site-specific impacts are considered negligible, or the cumulative impacts described in the RMP/FEIS are considered adequate.

B. General Setting

The project areas are in the northern portion of the Oregon Coast Range. Sites are generally found on south slopes or ridgetops at 800-3300 feet elevation. The following table summarizes site information. Maps of the project sites are in *Appendix 1*.

Table 3. Project Site Summary.

Landmark Name	Legal Loc.	Watershed	LUA	Elev. (feet)	Ac. ¹	Type	Notes
Lower Mill	T7S-R6W, Sec. 4 & 5	Mill Cr.	AMR, RR	1000'	70	Dry/Oak	3 mdws., large oak groves
Mid-Mill	T7S-R6W, Sec. 7	Mill Cr.	AMR, RR	1400'	12	Dry	4 small mdws., rock outcrops, oak
Upper Mill	T7S-R7W, Sec. 9	Mill Cr.	AMR, RR	1600' - 2400'	26	Dry	11 small mdws., rock outcrops, oak
Mill-Cedar	T7S-R7W, Sec. 23	Mill Cr.	AMR, RR	2300'	20	Dry	1 large mdw, rock outcrops, oak
Rickreall	T8S-R6W, Sec. 5	Rickreall Cr.	AMA, RR	1000'	5	Dry	1 small mdw, a few oak
Monmouth Peak	T9S-R7W, Sec. 9	Luckiamute River	AMR, RR	3200'	27	Mesic ²	1 large mdw., in noble fir zone
Harlan	T12S-R8W, Sec. 7	Big Elk Creek	GFMA, RR	800'	16	Mesic	2 meadows, low elevation
Bummer	T14S-R7W, Sec. 31	Upper Alsea River	LSR, RR	1400'	5	Dry	1 meadow, a few oak
East Prairie Mountain	T15S-R7W, Sec. 4	Lake Creek/ Upper Alsea	LSR	3300'	7	Mesic	1 mdw., comm. bldgs on peak
Prairie Mountain	T15S-R7W, Sec. 7	Upper Alsea River	LSR, RR	3300'	21	Mesic	1 mdw., comm. bldgs on peak
Briar Creek	T15S-R8W, Sec. 6	Lobster Cr.	LSR, RR	1100'	7	Mesic	1 small mdw.

¹ Approximate acreage of existing meadow area. Actual treatment areas are larger due to inclusion of meadow perimeter.

² Moist site - soil has sufficient moisture-holding capacity to support abundant vegetation.

C. Specific Resource Descriptions

1. Soils

a. Dry Meadows (Lower Mill, Mid-Mill, Upper Mill, Mill-Cedar, Rickreall Meadow, Bummer Meadow)

These sites are typified by very shallow soils over solid or fractured bedrock and / or with rock outcrops. All are found on south aspects, from 20-60% slope. Some shallow to moderately deep soils capable of supporting trees and shrubs are found along the outer meadow fringes of all the sites, and scattered within the Upper Mill, Mill-Cedar and Bummer Meadow sites. The shallow, stoney, cobbly loam soils found in the Upper Mill and Mill-Cedar sites are similar to Yellowstone and Valsetz series. Soils in Bummer meadow are pockets of deeper Klickitat soils interspersed with very shallow, rocky soil areas. On most of the area within these sites bedrock is generally at a depth of 0-20 inches.

The management concerns for soils on the **dry sites** are to protect the limited thin layer of soil and root mass that could be easily damaged with heavy equipment or eroded if the protective root and duff layer is removed. Due to the rocky nature of most of the soils, the potential for compaction is limited but should be considered where pockets of deeper, medium textured soils exist.

On sloping sites with thin soil, the low water holding capacity can result in high rates of surface water accumulation and run off. On bare soil the hazard of erosion can be high. Minimizing disturbance and loss of root masses and duff in the project areas should be a high priority, especially on the steeper areas. Any areas compacted and made bare from equipment use or fire trail construction will pose the greatest risk for water runoff and soil erosion. Mitigation measures can minimize this potential problem.

b. Mesic Meadows (Monmouth Peak, Harlan Meadow, East Prairie, Prairie Mountain, Briar Creek)

These productive upland meadows, also known as 'grassy balds' have more available soil moisture and are capable of supporting forest vegetation over much of the area. The soils in the mesic meadows are generally moderately deep to deep gravelly loams and clay loams bedrock is generally at a depth of 20-50 inches. Soil types represented are Mulkey (Monmouth Peak and Prairie Mtn), Kilchis rocky loam (Prairie Mtn), Preacher-Bohannon-Slickrock complex and Apt McDuff silty clay (Harlan Meadow), Preacher and Bohannon (Briar Creek Meadows), Klickitat (Bummer Creek Meadow).

The management concerns for soils on the **mesic sites** are to protect the layer of duff and root mass that could be easily damaged with heavy equipment. The soils on these sites are generally medium textured so the potential compaction of the soil is of a greater concern.

On sloping sites with compacted soil, the low permeability rate resulting from compaction can result in high rates of surface water accumulation and run off. On sloping sites with bare soil, the hazard of erosion can be high. Minimizing disturbance, loss of root mass and duff, as well as minimizing soil compaction in the project areas, should be a high priority, especially on the steeper areas. Any areas compacted and made bare from harvesting equipment or fire trail construction will pose the greatest risk for water runoff and soil erosion. Mitigation measures can minimize this potential problem.

The management concerns with burning on the Prairie mountain sites also include protecting a number of FAA and private radar and radio transmission towers and associated equipment buildings. There is generally good clearing of the light fuels around the facilities so protection of them is possible with a reasonable amount of planning and pre-treatment.

2. Vegetation

a. Dry Meadows

These sites may be described as dry meadows or rock gardens, and are typified by very shallow soils and the presence of drought-tolerant vegetation species. They are bordered by forests of Douglas-fir ranging in age from 26-200 years old.

All of the dry sites in this proposal contain Oregon white oak along their perimeter, and in some cases, in small groves within meadows. The Lower Mill site contains large stands of oak. In all of the dry sites, oak are affected by competition from conifers or crowding from other oak. Due to competition, many are in decline, and very few have wide, spreading crowns. A few Pacific madrone (*Arbutus menziesii*) are found, and bigleaf maple occur in a few moist areas associated with seeps and streams.

Shrubs, found in areas of relatively deep soil, include poison-oak (*Toxicodendron diversiloba*), oceanspray (*Holodiscus discolor*), snowberry (*Symphoricarpus albus*), baldhip (wild) rose (*Rosa gymnocarpa*), and Hairy manzanita (*Arctostaphylos columbianus*).

The most common grasses found in the dry meadow sites are introduced annual grasses such as dogtail grass (*Cynosurus echinatus*), soft brome (*Bromus hordeaceus*), and silver hairgrass (*Aira caryophyllea*). However native blue wildrye (*Elymus glaucus*), and Ross's sedge (*Carex rossii*), wood rush (*Luzula multiflora*) and many others are found. A wide variety of forbs occur, dominant species are of the genus *Iris*, *Brodiea*, *Eriogonum*, *Frittelaria*, *Mimulus*, *Montia*, *Scenicola*, *Microseris*, *Cardamine*, *Lomatium*, *Ranunculus*, *Vicia*, and *Lupinus*.

A carpet of mosses, primarily made up of *Racomitrium lanuginosum*, occurs in spots. Non-native species such as Scot's broom (*Cytisus scoparius*), and St. John's wort (*Hypericum perforatum*) can be found scattered in these sites.

Moisture is abundant in these sites in the spring, and many species flower and seed early in the season, before moisture becomes severely limited in mid-summer. Because of the relatively sparse vegetation, fuels are light and therefore, fire occurrence within these meadow interiors was probably infrequent. However, the margins of these meadows appear to have been an important ecotone, where deeper soils support shrubs and Oregon white oak, but did not contain conifer in the past. It is likely that a combination of soil conditions and frequent fire in the surrounding landscape maintained these meadows in open conditions.

Conifer encroachment appears to have occurred within the past fifty years in the perimeter of the meadows where soil is deep enough to support their growth. Douglas-fir have established from a few dozen feet up to several hundred feet within the previous meadow edge, decreasing meadow vegetation and Oregon white oak trees.

b. Mesic Meadows

These sites are moist, productive upland meadows, also known as ‘grassy balds’. They contain abundant grasses and forbs and tall stands of bracken fern (*Pteridium aquilinum*). The five meadows occur within forests of Douglas-fir ranging in age from 30-200 years old. Noble fir is found at the summit both Prairie Mountain and Monmouth Peak, where it may have originated solely from stock planted there in the 1950’s. Three meadows (Monmouth, Prairie Mountain and East Prairie) occur on ridgetops at relatively high elevation, and have probably been meadows for hundreds of years. Two (Harlan and Briar) are found on south slopes at lower elevations, and are most likely remnant openings from wildfires that burned in the last century.

Willow (*Salix scouleriana*), bigleaf maple (*Acer macrophyllum*), and red alder (*Alnus rubra*) are found in limited numbers in or around some of these meadows. Shrubs also are limited, but a few species occur in and around the meadows: elderberry (*Sambucus racemosa*), currant (*Ribes sanguineum*), snowberry (*Symphoricarpus albus*), and trailing blackberry (*Rubus ursinus*).

Red fescue (*Festuca rubra*), blue wildrye (*Elymus glaucus*), thingrass (*Agrostis diegoensis*), Ross’ sedge and (introduced) orchard grass (*Dactylis glomerata*) are common. Rocky areas support early hairgrass (*Aira praecox*). The Prairie Mountain sites contain a few clumps of beargrass (*Xerophyllum tenax*).

Bracken fern (*Pteridium aquilinum*) dominates portions of these meadows. Common forbs are lupine (*Lupinus lepidium*), yarrow (*Achillea millefolia*), woodland strawberry (*Fragaria vesca*), Oregon iris (*Iris tenax*), orange agoseris (*Agoseris aurantiaca*), fawn lily (*Erithronium grandiflorum*), false Solomon seal (*Smilacina stellata*), stream violet (*Viola glabella*), Menzies’ larkspur (*Delphinium menziesii*). Sheep sorrel (*Rumex acetosella*), St. John’s wort (*Hypericum perforatum*) and foxglove (*Digitalis purpurea*) are introduced species found in the meadows, particularly in disturbed areas.

Considerable snowpack accumulates each winter on the higher meadows, and temperatures limit the growing season. However, soils are deep and retain moisture well into summer, supporting abundant vegetation.

There are many non-exclusive hypotheses to explain what inhibits tree seedling establishment in meadows such as these (Magee and Antos, 1992). Frequent fire is the predominant explanation in mesic meadows, because soil and available moisture would otherwise allow tree establishment, and the vegetation provides abundant fuel for fire. Since lightning is rare in the Coast Range, it is possible that Native Americans regularly burned these areas for the array of food species that grow there (Zybach, in draft), and that fires may have spread into the Coast Range from burning in the Willamette Valley during east wind conditions. Livestock grazing, (and possibly associated burning) became the dominant use from 1870's until as recently as the 1970's.

Off-road vehicle use has created ruts on both private and BLM-managed lands at Prairie Mountain that have damaged vegetation and soils. The site has a gate in an effective location to block access, but is seldom locked due to the number of users of the communication sites there.

In early 1990's, logging and burning occurred on a five-acre area on Prairie Mountain to remove trees interfering with communication equipment on the site. There has been scattered re-growth of conifer in the area.

Conifer establishment on these sites varies in degree. Groves of trees in and around most of the meadows established at least thirty years ago and measure up to 20 inches diameter. Because conditions are more favorable for tree establishment than the dry meadows, conifers are more widespread and abundant within these meadows. However, East Prairie Mountain is an exception, with only a few recently established trees.

Surveys of the project areas for the presence of special status (federally listed or proposed threatened or endangered species, state listed species and Bureau sensitive species) vascular plants will be completed prior to implementation, in accordance with established survey protocols. There are no "known sites" of any special status plant species. Surveys were not completed for survey and manage lichen, bryophyte or fungi species, because the project sites are not considered habitat for old-growth associated species.

3. Fuels and Air Quality

a. Dry Meadows

These consist of mixed stands of grasses, forbs and shrubs interspersed with seedlings, saplings and pole sized Douglas-fir, Oregon white oak and Pacific madrone. Tree ages vary, most of the conifers and madrones are less than 40 years old, while the oaks vary up to 100 + years. Dead fuels consist of cured grass, forbs and shrubs generally less than 3 tons per acre. There is a light accumulation of dead woody material on the ground under the older established clumps of trees. These accumulations are for the most part twigs and limb wood less than 3 inches in diameter and amounting to less than 5 tons per acre (series 1-DFHD-4 and 2-HD-2). Fuel models for these sites are a combination of model 1 (light grass), model 2 (timber grass) and model 8 (closed timber litter).

b. Mesic Meadows

These consist of mixed stands of grasses and forbs interspersed with seedlings, saplings and pole sized Douglas-fir and noble fir trees. Tree ages vary, most are less than 40 years old. Dead fuels consist of cured grass and forbs, generally less than 1 ton per acre. There is a light accumulation of dead woody material on the ground under the older established clumps of trees. These accumulations are for the most part twigs and limb wood less than 3 inches in diameter and amounting to less than 6 tons per acre (series 2-DFHD-3 and 3-DFHD-3). Fuel models for these sites are a combination of model 1 (light grass) and model 8 (closed timber litter).

4. Wildlife

There are three types of meadows found in the Coast Range: wet, which are usually associated with streams or other low elevation geomorphology, mesic, which most often occur on or near ridge tops, and dry, which are commonly associated with shallow soils on steep south slopes. Several of the dry meadows are surrounded by Oregon white oak (*Quercus garryana*) woodland or savanna which adds more patch diversity to the conifer matrix.

Over geologic time most forest meadows are converted to forest as the soils and other site conditions become more favorable to tree establishment and growth. The conversion rate of meadows and oak associated ecosystems to conifer forest is slowed by periodic natural fires. As a result of fire exclusion policies, active meadow management will be necessary to offset the accelerated rate of succession from meadow to conifer forest. Active restoration and maintenance of existing meadow habitat in the Coast Range will continue to provide important islands of plant and animal diversity in the sea of conifer forests.

Nine of the eleven meadow restoration sites have late-seral (80-199 years) or old-growth (200+) conifer forest immediately adjacent to them, one meadow is within 0.25 mile of late-seral forest, and one is completely surrounded by early (0-39 years) and mid-seral (40-79 years) forest habitat. The affected environment is the ecotone between the meadow and the forest. The objective of the action is to convert the ecotone back to

meadow habitat. The great majority of conifers to be cut, burned, or girdled within the ecotone will come from early and mid-seral habitat types.

Meadow habitat is used by a wide variety of wildlife species, and some species are closely associated with meadows and the habitat elements they contain. An analysis of effects on listed terrestrial wildlife species is included in the analysis file. It analyzes effects on listed and special status species, including those closely associated with meadow habitat.

5. Hydrology

a. Project Area Hydrology

The proposed projects lie within the Lobster Creek (HUC# 1710020502), Upper Alsea River (HUC# 1710020501), Big Elk Creek (HUC# 1710020401), Luckiamute (HUC# 1709000702), Rickreall (HUC# 1709000703), Mill Creek (HUC# 1709000804), & Lake Creek (HUC# 1710020608) 5th-field watersheds. Proposed projects by sub-watershed (6th-fields) are shown in Appendix 4, Table 1. The project areas are covered in the following watershed analyses: Lobster-Five Rivers (1997), South Fork Alsea (1995), Big Elk (1995), & Mill Creek, Rickreall, Rowell, Luckiamute (1998). Upper Lobster Creek and Tobe Creek (catchment) are key watersheds.

Small tributary headwater channels, mostly with ephemeral or intermittent flow regime, predominate in the project area. These are Rosgen type A channels with cascade and step/pool morphology: moderate to steep gradient with low width/depth ratio and low sinuosity. Reflecting their colluvial nature (dominated by hill-slope geomorphic processes) channel substrates are predominately in the small gravel to sand size classes. Where shallow soils overlay resistant bedrock, streams may flow subsurface along the soil/bedrock interface, reemerging periodically in developed channels or as dissipated overland flow. Examples of these streams occur at the Prairie Mountain and Rickreall project sites.

All channels viewed in and near the project areas are vegetatively or bedrock stabilized and currently in proper functioning condition (U.S.D.I. 1998). None of the channels in the project areas are currently functioning at risk or nonfunctional; nor exhibit indications of instability (i.e. high rates of bank erosion and sediment transport, nick points, etc).

In cases where the streams originate and/or flow through open meadows, there is little to no channel shading and LWD is lacking. Summer flows are a fraction of winter levels with most streams retreating subsurface.

b. Project Area Climate

Annual precipitation in the project area sections ranges from approximately 57 inches (at Lower Mill Creek) to 135 inches (near East Prairie Mountain).

Northern project sites have a mean 2-year precipitation event of approximately 4.0-4.5 inches in a 24-hour period. The southern project sites have a mean 2-year/24 hr precipitation event of approximately 5.0 inches (N.O.A.A. Precipitation-Frequency Atlas for Oregon, Volume X). At a distance of over 18 miles from the ocean, fog and fog drip are not significant contributors to watershed hydrology.

Elevation of the project sites ranges from 800 to 3300 feet above sea level. While snow pack accumulation in the Oregon Coast Range is unusual, elevations between 1500'-3000' lie within a transient snow zone. In most years, at elevations above 1500 feet, snow remains for short periods and may be subject to rain on snow events (ROS) (USDI 1995). Overlapping areas between high intensity rainfall and high ROS events are particularly vulnerable to extreme storm events and may lead to flooding (USDI 1996). Two of the proposed project sites, Upper Mill Creek and Mill-Cedar, lie within this transient snow zone.

c. Project Area Water Quality

Fine sediment and turbidity

Turbidity data is limited for project vicinity streams. Occasional turbidity grab samples were collected 1995-1997 during winter storm events in Tobe Creek (near Bummer meadow), E. Fork Lobster (near Prairie Mountain), and Little Lobster (near Briar Creek). Measured median nephelometric turbidity unit (NTU) levels were 44, 2, and 6 respectively.

The median values for E. Fork Lobster and Little Lobster Creeks are well below the 30 NTU standard Oregon DEQ set for the Umatilla sub-basin Total Maximum Daily Load (TMDL) assessment (ODEQ 1999). The median value for Tobe Creek exceeded the state standard, however the sampling was conducted during the winter of 1995/1996, during the unusual 1996 flood event. Grab turbidity samples collected on 12/1/94 in Tobe Creek, at bank full flow, had NTU values of 17-20, below the state standard (USDI 1995).

Stream Temperature

Data for summer stream temperature monitoring (generally June-September) is available for Mill Creek (near Lower Mill Meadow/1997), E. Fork Lobster (Prairie Mountain/1992), Rock Creek (E. Prairie Mountain/2000), and Tobe Creek (Bummer/1997). Mill Creek was the only stream whose maximum daily temperature exceeded the State of Oregon's Department of Environmental Quality's standard for stream temperature (17.8° C). Among the factors contributing to increases in stream temperature are: lack of adequate streamside shading and a lack of deeper pools in the system (associated with LWD jams).

Other Water Quality Parameters

Macroinvertebrate sampling can be used as an indicator of “stream health” as particular species of macroinvertebrates are able to tolerate varying water quality conditions. Between 1995 and 2000, macroinvertebrate sampling was conducted for sites on Lobster Creek, South Fork Alsea, Mill Creek and tributaries. The data was analyzed utilizing the Level 3 Assessment methods suggested by the Oregon Department of Environmental Quality (DEQ) (Water Quality Monitoring Guidebook, Version 1.03, Chapter 12). Using the DEQ’s suggested interpretation of the Level 3 assessment scores, 7 sites in Lobster Creek were found to be “severely impaired”, 7 sites were “moderately impaired”, and 15 sites were “slightly impaired” (BLM 2000). Sites on the South Fork Alsea mainstem and several sites in Mill Creek were found to be “slightly impaired.” Upper Mill Creek was found to be “unimpaired.”

All of the severely impaired sites were collected prior to 1995 in the Lobster Creek drainage and the exact protocols followed during sampling are unknown. However, most of the sites in the Lobster Creek drainage can be viewed as at least moderately impacted; that is, the samples show a trend in invertebrate populations that indicate stressful conditions in the aquatic system. Stressful conditions may include elevated suspended sediment and turbidity levels, increases in stream temperature and/or lack of suitable substrate materials.

Additional water quality parameters (e.g. nutrients, dissolved oxygen, pesticide and herbicide residues, etc.) are unlikely to be affected by this proposal and were not reviewed for this analysis (US EPA 1991).

Oregon Department of Environmental Quality (DEQ)

The Oregon Department of Environmental Quality’s (DEQ) 1998 303d List of Water Quality Limited Streams (<http://waterquality.deq.state.or/wq/303dlist/303dpage.htm>) is a compilation of streams which do not meet the state’s water quality standards. A review was made for all the primary and secondary streams downstream from the proposed project areas. No listing was found for Bear, Coldwater, Cedar, Wind, Bummer, Lake, Coleman, Rock, or East Fork Lobster creeks, or the South Fork Alsea River. Sites which occur in watersheds with 303d listed streams are listed in Appendix 4, Table 2.

The DEQ published an assessment, the 319 Report, which identifies streams with potential non-point water pollution problems (1988 Oregon Statewide Assessment of Nonpoint Sources of Water Pollution). Upper Mill, Rickreall, Luckiamute, Big Elk, and Lobster Creeks were identified as having moderate water quality problems affecting general water quality and were also listed for the elements below:

Upper Mill Creek: aquatic habitat

Rickreall Creek: fish, aquatic habitat, drinking water supplies

Luckiamute Creek: fish, aquatic habitat

Big Elk: fish, aquatic habitat

Lower Lobster: fish, aquatic habitat

However, no description of the problem or data in support was located in the report. Other sources of information (watershed analysis, ODFW habitat surveys) give more up to date information, supported by data, on fish and aquatic habitat conditions for these streams (see Fisheries report).

d. Project Area Beneficial Uses

Beneficial uses of surface water in the project area watersheds include domestic use, livestock, irrigation, manufacturing, water storage, resident and anadromous fish, recreation, and esthetic value. Distance from the project sites to domestic and livestock/irrigation use is displayed in Appendix 4, Table 3 (source: *Water Rights Information System* on the Oregon Department of Water Resources website). For additional information regarding fish presence, see the Fisheries section in this document. BMPs would be implemented to eliminate or minimize any potential affects to beneficial uses in the watersheds.

6. Fish

All of the meadow locations for restoration have limited water resources due to the nature of meadows and Oak savannahs (dry ridges or slopes). These areas are typically steeper headwater areas with very few streams. Several meadows include stream origins. No fish are within any of the proposed areas for restoration, however, all project areas have fish and/or listed fish downstream from the project areas (see NEPA file for distance to listed fish distribution).

Coastal Coho Salmon (*Oncorhynchus kisutch*) are listed as threatened under the Endangered Species Act. These fish are down stream from any project area within the Coast Range. Upper Willamette Steelhead and Upper Willamette River Chinook are listed as threatened under the Endangered Species Act. These fish are down stream from any project area within watersheds that flow into the Willamette Valley. Listed fish will not be affected by this project due to distances down stream from project areas, the light touch nature of this project (very little ground disturbance) and design features to limit impacts to riparian reserves and the aquatic environment.

7. Recreation, Rural Interface, and Visual Quality

a. Recreation

The project areas are in a forest and meadow setting. Some are accessible by gravel roads but they contain no developed recreational facilities. The landscape setting has been altered by timber management activities (road construction and logging), which are likely to continue on private and state lands in the vicinity regardless of federal management practices.

Recreational use consists of dispersed camping, hunting, target shooting, hiking, horseback riding and off-road vehicle use. Undesignated trails associated with these uses

are not known, but may exist. Most sites do not have direct motor vehicle access or access is effectively blocked by use of gates. Of those sites with vehicle access, off-road vehicle use is not apparent, with the exception of the Prairie Mountain site, where it has caused eroded ruts devoid of vegetation. The road to the site has an effectively sited gate that is seldom locked, probably because of the frequently-accessed communication sites.

b. Rural Interface

None of the proposed restoration sites are directly adjacent to private residences or non-forest uses. Residents living in the valleys would be screened from project disturbance due to distance and topography.

c. Visual Resources

The majority of proposed sites are within Visual Resource Management VRM class 4. Management objectives allow major modifications of existing landscapes with moderate levels of change to the characteristic landscape. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize visual disturbances.

Monmouth Peak is in VRM 3. Management objectives call for partial retention of the existing landscape with moderate levels of change to the characteristic landscape. Management activities may attract attention, but should not dominate the view of the casual observer.

Lower Mill is in VRM 2. Management objectives call for retention of the existing landscape with low levels of change to the characteristic landscape. Management activities may be seen but should not attract the attention of the casual observer.

Figure 4. Monmouth Peak meadow, and view west.



IV. ENVIRONMENTAL CONSEQUENCES

This section describes the environmental consequences that would result from implementing this action or the alternatives. (See also Appendix 2).

Table 5. Summary of Effects of the Proposed Action and Alternatives

	Meadow extent	Vegetation	Fuels & Burning	Recreation and Visual Quality	Wildlife	Hydrology
Alt. 1 No Action	Slow decrease; static on very dry sites.	Potential decrease in native meadow species abundance; noxious weed abundance static.	No Effects	No Effects	Loss of meadow habitat and negative effects to species that use meadow habitat.	Possible slight decrease in water yield, but little effect on current hydrologic regime.
Alt. 2 Restoration including prescribed fire	Increase back to approx. 1950 perimeter in one or more treatments.	Increased abundance & diversity of native meadow species; measures needed to reduce risk of weeds.	Short-term fuels increase. Effects of pile burning and broadcast burning. Manageable risks.	Reduced damage from off-road veh. use at Prairie Mtn. Smoke drift to valleys.	Beneficial effects to species that use meadow habitat and snags. Increased landscape diversity.	Alteration of capture and routing of precip. Measurable effects unlikely.
Alt. 3 Restoration without prescribed fire	Same as Alt. 2., but without use of fire, maint. of meadow habitat somewhat more difficult.	Same as Alt. 2, but diversity and condition of native species more static. More conifer cutting & girdling.	More fuel treated by piling and burning. No fire effects on vegetation. Very low risk of fire escape or damage to buildings from pile burning.	Same as Alt. 2, but no smoke drift affecting recreation and aesthetics. No risk to adj. land-owners or buildings.	Same as Alt. 2, but no standing dead trees created by fire mortality (short-term snag habitat).	Same as Alt 2.

A. Direct, Indirect, and Cumulative Effects

The Proposed Action and alternatives would have environmental effects, however they would not have effects beyond those described in the RMP EIS and the Northwest Forest Plan FSEIS (USDA Forest Service and USDI Bureau of Land Management, February 1994). This analysis incorporates by reference the analysis of cumulative effects in the RMP EIS (Chapter 4) and the Northwest Forest Plan FSEIS (Chapter 3 & 4, pp. 4-10).

B. Alternative One: No Action

1. Soils, Hydrology and Fish

The no-action alternative would result in continuation of current trends.

2. Vegetation

a. Conifer Removal

No action would result in a continued decrease in meadow extent as trees continue to establish and grow there, a slow process because it occurs primarily at the meadow margin. Conifer establishment in mesic meadows could diminish meadow size measurably each decade, but some areas would probably always remain unforested. In dry meadows, potential tree establishment is limited to the edges of the meadows and pockets of relatively deep soil. Eventually conifer would grow in all but the areas of thinnest soil that support sparse vegetation. While succession is a natural process in the absence of disturbance, the result is a loss of uncommon meadow habitat for a gain in very common closed conifer habitat.

b. Prescribed Fire

Prescribed broadcast burning would not occur. The effects of conifer removal, fuel reduction, and vegetation response would not occur.

c. Oak Enhancement

Oregon white oak is not tolerant of shade, and generally dies quickly when overtopped by Douglas-fir. Some particularly well-established trees may live for 20 years after being overtopped (McCulloch, 1940). Oak in dense groves exhibit very slow growth and narrow, vase-shaped crowns with fewer boughs. Without removal of overtopping conifer or thinning, Oregon white oak trees found in dry meadows will continue to decline from overtopping and stagnate from high densities. Eventually, most of the oak found at the meadow edges will be lost as they are overtopped by conifer, and oak in dense stands would never develop large, spreading crowns that favor wildlife use and acorn production.

d. Native Species Enhancement

Continued establishment and growth of conifer, and potential increases in noxious weeds would reduce native meadow species. Without the disturbance caused by tree felling,

slash piling and burning, and prescribed burning, little change to species abundance and distribution would occur. Without seeding or planting native species, little increase in their abundance and diversity would occur.

e. Snag Habitat Creation

No trees would be girdled for snags, so no effects would occur.

3. Fuels and Air Quality

Larger fuels would continue to accumulate through encroachment and growth of trees in the meadows. Fuel models would slowly transition from the lighter grass-dominated models to the timber-dominated models. There would be no impacts to air quality.

4. Wildlife

The no-action alternative will result in an unnaturally accelerated rate of conversion from meadow to conifer forest habitat resulting in a loss of plant and animal diversity in those watersheds.

If no action is taken to restore and maintain the meadow and oak habitats by mimicking periodic natural disturbance caused by fire, Douglas-fir will continue to establish in all but the driest non-forest patches and eventually most will be converted to closed-canopy conifer forest matrix, an abundant habitat in western Oregon. The affected watersheds would lose historic meadow and/or oak woodland/savanna habitat decreasing both its floral and faunal biodiversity. Several Special Status Species may be negatively impacted as these patches become smaller and smaller in size and further isolated on the landscape (refer to Appendix 4).

The No-Action Alternative will have long-term negative impacts for all wildlife species which nest and/or forage in meadows and oak savanna/woodland habitats in the affected watersheds. The significance of the impacts is unknown due to the small number, small size, and isolated nature of these types of patches on federal lands.

5. Recreation, Rural Interface and Visual Quality

No modifications to the landscape character of the proposed units would occur, except a very gradual decrease in meadow extent.

C. Alternative Two: Proposed Action

1. Soils

The following effects apply to all components of the Alternative.

If logs are removed from any sites using a helicopter, no impacts to soils are expected. Soil damage caused by burning of slash piles would be insignificant on the mesic meadow sites with the deeper soils. Some negative effects would possibly occur on the shallow soil areas in the dry meadows. These negative impacts can be minimized by keeping the hand piles small and burning after the fall rains have begun. To minimize the possibility of encouraging non native plants from occupying burn areas, they should be seeded with desirable species as soon as possible after fire extinguishment. Minor soil disturbance would result from construction of hand fire lines, and potentially, from mop-up activities.

2. Vegetation

a. Conifer Removal

In one or more entries, conifer removal would return meadow extent that existed 30-50 years ago. Where encroachment has occurred, the forest-meadow transition grades from older to younger trees, and from higher to lower density. After removal of encroaching conifer, the edge will have greater contrast from older trees to open meadow. It is possible that some trees will blow down on this edge, but it is unlikely because they are older than those cut, and were taller and therefore had prior exposure to wind. In some meadows, where the forest-meadow transition has been more static in recent decades, a minor degree of conifer removal would occur. Removal of cut trees by helicopter on Monmouth Peak and Prairie Mountain would have little effect other than to reduce fuels by removing the largest trees from the site.

b. Prescribed (Broadcast) Fire

Three sites would be broadcast burned and portions of three others, totaling approximately 55 acres of current meadow, plus the cleared perimeter. Prescribed burning has variable effects on vegetation, depending on species growth characteristics, fire behavior, and environmental conditions before and after burning. In general, native species on these sites persisted well under a regime of frequent fire, and could be expected to survive, and possibly increase in vigor. Burning would remove thatch and dead standing vegetation. Most species would readily re-sprout from live root crowns. Areas of slash remaining from conifer removal would experience greater fire severity, and could kill existing vegetation and could allow pioneer species to establish.

c. Oak Enhancement

Removal of conifer overtopping Oregon white oak, thinning of dense oak, and planting of oak seedlings in appropriate areas would increase the abundance and improve the condition of the oak that are associated with dry meadows. Conifer release and oak thinning would improve vigor, growth, and crown structure of the oak. Oak response would be limited by previous suppression and the often harsh environmental conditions found in the dry meadows, but they would be more likely to develop large, spreading crowns that favor wildlife use and acorn production. Oak abundance and distribution would be increased by planting seedlings where conifer removal from meadow margins has made growing space available in the relatively productive transition zone. Conifer removal and oak thinning would decrease shade, increasing meadow species abundance.

d. Native Species Enhancement

Conifer removal, slash piling and burning, and prescribed burning would affect vegetation communities in complex and variable ways. Canopy removal would increase ground vegetation. Because a sparse cover of meadow species persists beneath the canopy of advancing forest, these species can rapidly expand in response to the decreased shade and root competition. 'Pioneer' species, including non-natives can also establish in the season or two following conifer removal. Similarly, the sites of burned slash piles would be re-colonized by pioneer species. Slash remaining in meadows that are not burned could shield herbivory and provide more rodent habitat, affecting vegetation use by wildlife.

Seeding or planting native species following disturbances that open growing space would reduce the potential for noxious weed establishment, and potentially increase abundance and diversity of native vegetation.

e. Snag Habitat Creation

Girdling trees to create snags will have similar effects as conifer removal, but on a localized basis associated with single large trees. The primary effect would be to increase ground vegetation, and a gradual accumulation of limbs and bark that would drop from the tree over time, then slowly decay.

3. Fuels and Air Quality

The following effects apply to all components of the Alternative.

Helicopter removal of material >9" diameter would reduce control hazard from spotting during broadcast burning, and reduce heat impact to soils.

Fuel loading and fire risk will be temporarily increased at all the sites as a result of the proposed action. The slash resulting from conifer cutting within the meadow areas would result in a higher risk of fire. In conifer cutting areas, the dead fuel loading is expected to be increased by 0 to 15 tons per acre with a discontinuous arrangement. Total dead fuel loadings will range from approximately 1 to 18 tons per acre. The fuel model will shift from Model 1 / 2 / 8 to model 1 / 2 / 10. Overall, the fire hazard following this action will be moderate. The risk for a fire start will be highest along roads from vehicle traffic during the period when attached needles dry out the first season following cutting. After burning of piles, the dead fuel loading will be < 4 tons / acre. Lopped and scattered slash will break down over a period of 15 to 20 years. During this time the risk of fire will be moderate during the first 1-2 years then diminish as the fine fuels break down. After 2 years there would be little difference in risk of a fire start between treated and untreated sites, however the resistance to control of a fire in the treated area would be higher due to the increased amount of fuel.

With introduction of periodic broadcast burning it is expected that the fuel model will shift to a model 1 (light grass) or a combination model 1 and model 2 (light grass with a shrub component). The fine fuel loading at the time of burning would be around .5-2 tons per acre. At least 70% of this fuel, along with .5 - 1 ton/ acre of live foliage, would be consumed with a broadcast burn. Any large down woody material would also be reduced during a broadcast burn. Some pre-treatment and or rapid mop-up may be used to reduce the loss of this material if so desired by wildlife issues. Otherwise it is expected that after repeated periodic broadcast burning, large wood on the site would only occur periodically when a tree falls over and once down, a log may only remain on site for 10-35 years depending on the frequency of maintenance burning.

Affects on air quality will be minimal and short lived. Piles would be burned in compliance with smoke management regulations after Fall rains have begun. Good atmospheric mixing conditions exist at this time and will help to dilute and disperse smoke. Any residual smoke should be of short duration and occur during a period of the year when there is less outdoor activity, and an increasing likelihood of rain storms that will scour the air shed and extinguish residual fire. For broadcast burning, effects should be similarly short lived. Very light fuel loadings will result in short fire residence time and rapid extinguishment. Residual smoke would occur from stumps and down logs. With repeated burning the fuel loading of large fuels will diminish and reduce the amount of residual smoke from smoldering material. Mop up of smoldering material will be done if smoke poses a concern with local residents.

Implementation of prescribed broadcast burning would require careful application of measures to reduce risk of damage to communication sites at Prairie Mountain, East Prairie Mountain, and even Monmouth Peak (though the building is more distant from the project site) and for spread to adjacent private lands. Damage to improvements, timber value, and natural resource values, as well as suppression costs and risks to human safety can result from escaped fires. Using standard operating procedures, under an approved burn plan, these risks are quite low.

4. Wildlife

The following effects apply to all components of the Alternative.

The proposed action is to restore and maintain selected meadow and associated oak habitats within the conifer matrix in several watersheds by mimicking periodic natural disturbance. The affected watersheds would continue to provide historic meadow and/or oak woodland/savanna habitat thus maintaining the floral and faunal biodiversity associated with these non-forest patches. Several Special Status Species may be positively impacted if these patches are prevented from becoming too small and too fragmented (refer to Appendix 4). The action is expected to have no significant impacts on the adjacent conifer forest habitat or the species it supports.

The Proposed Action Alternative would have long-term positive impacts on those wildlife species which nest and/or forage in meadows and oak savanna/woodland habitats in the affected watersheds. The significance of the impacts is unknown due to the small number, small size, and isolated nature of these types of patches on federal lands. Snag creation will provide habitat for several Special Attention Species bats, for the Bureau Sensitive purple martin (refer to Appendix 4), and for many other cavity nesting species.

The Proposed Action Alternative would have no effect on the following species associated with mature conifer forest habitat; northern spotted owl, marbled murrelet, bald eagle, red tree vole, and Oregon Megomphix snail.

5. Hydrology

a. Conifer Removal and Snag Habitat Creation

Measurable effects to hydrologic processes, channel conditions, and water quality due to the proposed action are unlikely. Alterations in the capture, infiltration and routing (both surface and subsurface) of precipitation may occur as a consequence of the mechanical removal of trees and reductions in stand density. This effect would be difficult to measure and unlikely to substantially alter streamflow or water quality. Numerous studies have documented increases in mean annual water yield and increases in summer base flow following the removal of watershed vegetation; presumably vegetation intercepts and evapotranspires precipitation that might otherwise become runoff (Bosch et al. 1982). Thus, it can be assumed that this project will likely result in some small increase in water yield which correlates with the removal of smaller conifers, the death of larger conifers by girdling, and a reduction in vegetation cover through prescribed burning. However, other than increased peak flows (see Cumulative Effects this report), the increase in fall and winter discharge from forest activities is likely to have little biological or physical significance (U.S.E.P.A. 1991).

Increases in stream temperature as a result of this action are also unlikely; the ten foot no-treatment zones along all surface waters should maintain shading where it exists. Many of the streams within the project sites have their headwaters in open meadows where they are exposed to direct sunshine. This is a natural consequence of a meadow habitat. At stream heads, where groundwater and surface water interfaces, stream temperatures are relatively insensitive to change and are likely consistently below ODEQ temperature standards.

It is unlikely that the proposed projects will lead to measurable increases in sediment delivery to streams, stream turbidity, the alteration of stream substrate composition, or sediment transport regime. Stream buffers would eliminate disturbance of streamside vegetation; no trees would be cut from the stream bank or where roots are stabilizing the stream bank. Tree girdling and piling of smaller conifers will have minimal to no ground disturbance and no activities will take place directly in stream channels.

b. Prescribed Burning

Prescribed burning has a low risk of effecting stream channels, hydrology, or water quality. Fire retardant foam would not be used within 50 feet of any running or standing water. No ignition would occur and driptorches would not be refueled within 10 feet of any running or standing water. Pile burning may produce small patches of soil with altered surface properties that restrict infiltration. These surfaces are surrounded by large areas that will easily absorb any runoff or sediment that reach them. In addition, piles will be burned outside of stream protection zones (buffers) and away from standing or running surface water.

c. Oak and Native Species Enhancement

Environmental consequences would be the same as those described for conifer removal and snag habitat creation.

Site preparation and planting are not likely to result in measurable direct or indirect effects to water quality, hydrological function and stream channel condition. Some local erosion may result from scalping circles around planting spots and during planting. However, the amount of sediment transport would be minimal and unlikely to reach streams due to the small extent of disturbance surrounded by intact vegetation mat.

d. Cumulative Effects

The proposed action, when combined with other proposed actions in the project watersheds, is unlikely to have detrimental cumulative effects on the hydrologic regime. Measurable effects to watershed hydrology, channel morphology, and water quality as a result of the proposed action are unlikely. In the short term, removing vegetation may alter the capture and routing of precipitation. However, this effect would be difficult to measure and unlikely to significantly alter stream flow or water quality.

In almost all cases, removal of more than 20% of the vegetative cover over an entire watershed will result in increases in mean annual water yield. Removal of less than 20% of vegetative cover has resulted in negligible changes where it was not possible to detect any effect (i.e. the error in measurements was greater than the change) (Bosch 1982). In addition, alterations in the timing and/or quantity of peak flow events as a result of forest harvest and road construction have been studied for several decades (Jones and Grant 1996). The proposed project sites would each affect less than 1% of the forest cover in their respective watersheds. Therefore, affects from this project on cumulative effects to streamflow are too small to be measured with reasonable accuracy.

In conclusion, this proposal is unlikely to impede and/or prevent attainment of the stream flow and basin hydrology, channel function, or water quality objectives of the Aquatic Conservation Strategy (ACS).

6. Fish

a. Conifer removal, fuel treatment, oak enhancement, and snag creation

Conifer removal would not affect streams or aquatic environments due to the limited numbers of conifers within riparian areas. Most meadows that have streams are out in the open or are dominated by hardwoods and other species. Cutting of scattered conifers would not increase temperature in intermittent streams. Because these trees would not be yarded out, very little disturbance is expected and no increases in sediment or turbidity are anticipated. Streams that have well developed conifer dominated riparian areas would be protected.

b. Prescribed fire

Burning of conifer piles would not impact the aquatic environment because these piles would be small scattered piles and be outside the 10 foot stream protection zone. Vegetation would filter any sediment or ash that could possibly be transported toward streams. Streams that have well developed conifer dominated riparian areas would be protected.

Broadcast burning would only be done under conditions that would only burn for a short duration, consuming the top layer of grassy vegetation. This would still leave live vegetation. On sites where fire burns through areas with live conifers it is expected to kill 90 % of the conifers under <5" dbh, and 50% of trees from 5" to 10" dbh. This amount of mortality would be extremely variable and would likely be less in damp riparian areas near streams. Due to the limited amount of fire near streams, a minimum 10 foot stream protection zone and timing of the burn (light burn) no impacts to fish and listed fish are expected. Areas proposed for broadcast burning are:

Prairie Mountain: Prairie Mountain has only two small headwater streams. Listed fish are down stream approximately 1.5 miles. Under Spring conditions, it is anticipated that a very light burn will occur and impacts to the stream and listed fish would be minimal.

East Prairie Mountain: East Prairie Mountain has only a few small areas of riparian and stream origin within the project area. Listed fish are down stream approximately 4 miles and would not be affected.

Monmouth Peak: Monmouth Peak has only a small area of riparian reserve and no streams within the project area. Listed fish are down stream approximately 1 mile and would not be affected.

Rickreall: Rickreall would have only limited burning in the northern part of this unit. The riparian area of the headwater stream that runs through this area is dominated by hardwoods and would not be subjected to burning. Therefore no impacts to the stream are anticipated.

Mill-Cedar: Only limited burning is proposed for this project area. Mill-Cedar has 3 or 4 headwater streams that flow out of the project area. These streams would have the 10 foot stream protection zone and also have a hardwood dominated area lower in the project area. This hardwood dominated area would not be burned. Listed fish down stream approximately 9.5 miles would not be affected by this action.

Lower Mill: Lower Mill has several small headwater streams that enter the project area. These small streams have areas that are dominated by hardwoods and closed conifer canopy lower in the project area and would not be burned. This larger buffer would prevent any transport of sediment into area streams. Listed fish are down stream approximately 1.8 miles and would not be affected.

c. Native Species Enhancement, Snag Creation and Oak Planting

None of the aspects of these three components would impact area streams, or listed fish. No disturbance is expected and no impacts to streams would be created.

d. Overall Impacts

Some short term, minor increases in turbidity could result as a consequence of this project. However, this increase in turbidity would be very minor. No impacts to fish, aquatic organisms or the aquatic environment is expected. No impacts to listed fish down stream are expected.

7. Recreation, Rural Interface and Visual Quality

a. Recreation

Current uses of the sites could be restricted during project implementation, but would resume after completion. Any existing trails would probably not be affected, but no restoration is planned. This project could increase big game forage use, possibly increasing hunting opportunities.

Recreational use of the units without vehicle access is expected to remain low. There may be slight increases in use of accessible units if opportunities are available. Correct implementation of access control at Prairie Mountain and, possibly, placement of natural barriers (e.g. boulders) and/or warning signs should decrease damage occurrence and allow rehabilitation of existing damage.

b. Rural Interface

Smoke from the pile burning and broadcast burning might reach valley residents, but it should be well dispersed and of short duration. If a helicopter is used to remove logs from Prairie Mountain and/or Monmouth Peak, residents might be disturbed by flight traffic. The sound of a chainsaw might be heard if environmental conditions are right.

c. Visual Resources

There would also be some short-term (days) decline in visual quality as a result of the smoke created. However, compliance with state smoke management regulations would minimize valley smoke.

Some disturbance during and shortly after the various project activities may be observable. On most sites, a larger open meadow setting will still be maintained, and vegetation disturbed by restoration and burning activities would be expected to return very shortly.

D. Alternative Three: Restoration Without Prescribed Fire

(This alternative includes all components except the use of prescribed broadcast burning. Burning of piled slash would occur in this alternative.)

1. Soils

The effects on soil, including those resulting from pile burning, would be the same as described for alternative 2. Since no prescribed broadcast burning is planned under alternative 3, the related impacts to soils from burning, line construction or mop-up would not occur.

2. Vegetation

a. Conifer Removal

The effects of conifer removal would be similar to the Alternative 2, the Proposed Action, however, three sites and portions of three other sites would not be broadcast burned. Without the use of prescribed fire on these sites, more conifer removal would be accomplished with cutting and girdling and more slash would be treated by piling/burning or lopping.

a. Prescribed Fire

Prescribed broadcast burning would not occur. The effects of conifer removal, fuel reduction, and vegetation response would not occur.

b. Oak Enhancement

Effects would be the same as Alternative 2.

c. Native Species Enhancement

Under this alternative, fuels on 55 acres of current meadow, plus cleared perimeter, would be treated by piling and burning, instead of prescribed broadcast burning as in Alternative 2. The piling and burning would create small areas subjected to more intense fire for a longer duration. On these pile burning sites, existing vegetation would likely be killed, allowing pioneer species to establish, including non-natives. Vegetation would not receive potentially beneficial effects of prescribed broadcast burning.

d. Snag Habitat Creation

Effects would be the same as Alternative 2.

3. Fuels and Air Quality

Under this alternative, removal of large diameter (>9") material would not be necessary to reduce fire spotting potential, because prescribed burning would not occur, but fuel removal would still be desirable. Under this alternative, since broadcast burning would not be used to kill and consume conifer, more cutting and girdling would be necessary, and the resultant fuels would require treatment by piling and burning or lopping.

Effects on increases in dead fuel loading and fire risk would be the same as described for Alternative 2 except that there would be no reduction in fuel loading or fire risk brought about by burning. The transition to the lighter fine fuel models 1 and 2 that would occur as a result of repeated broadcast burning on selected sites would not occur under alternative 3. In the absence of broadcast burning, conifer encroachment would resume following treatment although it would be set back significantly by the cutting done under this alternative.

Prescribed broadcast burning would not take place. The risk of escaped fire and/or damage to communication sites resulting only from burning of hand piles would be very low.

4. Wildlife

The effects would be the same as Alternative 2.

5. Hydrology

Under this alternative, the direct, indirect and cumulative effects to water quality, hydrological function and stream channel conditions would be similar to those for the proposed alternative except that any potential disturbance from prescribed burning would not occur.

6. Fish

This alternative would have essentially the same impacts as the proposed action, except that negligible inputs of sediment from broadcast burning would not occur.

7. Recreation and Visual Quality

Effects on recreation, rural interface and visual resources would be the same as Alternative 2, except the possibility of smoke drift into valleys would be reduced. Short-term negative effects on recreation, and visual quality would be avoided.



Figure 5. Oregon White Oak in Lower Mill Creek Meadow

V. CONSULTATION AND COORDINATION

A. List of Preparers

NAME	TITLE	DATE/INITIAL
Hugh Snook	Team Lead, Ecologist	6/26/03 HWS
Gary Licata	Wildlife Biologist	6-30-03 gal
Tom Tomczyk	Soil Scientist/Fuels Specialist	Acting for COMT. 4/7/03 DM
Traci Meredith	Recreation, Rural Interface, Visual	6/30/2003 Tmm
Diane Morris	Silviculturist (Consultation only)	6/30/03 DM
Ron Exeter	Botanist (Consultation only)	June 30, 2003 / RE
Tom Vanderhoof	Cultural Specialist	6/30/03 TMV
Steve Liebhardt	Fisheries Biologist	6/30/03 SL
Ashley La Forge	Hydrologist	6/30/03 AL.
Carolyn Sands	NEPA Coordinator	6/7/03 CBS

B. Consultation

Consultation with the Fish and Wildlife Service or NOAA Fisheries (Formerly National Marine Fisheries Service) is not required pursuant to the Endangered Species Act, because the proposed action and alternatives would have no effect on any listed species. The Confederated Tribes of the Grand Ronde Indians were notified of this project during the scoping process, requesting information regarding tribal issues or concerns relative to the project. A response was received supporting the proposal, and a discussion occurred between the project leader and the Cultural Protection Specialist for the Tribes, regarding the project, cultural resources and a request to survey. A cultural resources survey using intuitive meander survey method will be conducted at the Lower Mill project site prior to any hand fireline construction at the request of the Grand Ronde Tribe

C. Public Participation

Efforts to involve the public in planning for the proposed action were as follows:

- A press release was submitted to the (Dallas, Oregon) *Polk County Itemizer-Observer* and the (Corvallis, Oregon) *Gazette-Times* newspapers in April, 2003.
- A description of the proposal was included in the March, 2003 Salem BLM *Project Update* and mailed to more than 1200 individuals and organizations.
- A legal notice announcing availability of the EA for public review and comment will be submitted to the *Polk County Itemizer-Observer* and (Corvallis, Oregon) *Gazette-Times*.
- The EA will be mailed to parties who responded to initial public input.
- The EA and FONSI are available for review on the internet at Salem BLM's website, <http://www.or.blm/salem> (under Planning).
- A letter was mailed to interested parties on April 8, 2003 outlining the proposed action and requesting initial public input. The letter was sent to 21 groups, 11 businesses, 21 state or local government agencies, 2 Native American Tribes, and 17 individuals. The BLM received one phone call requesting clarification of the proposed action and one written response. One comment was received: the Cultural Protection Specialist for the Confederated Tribes of Grand Ronde requested a cultural resource survey in the Lower Mill project site prior to any ground-disturbing activity.



Fig. 6. *Prairie Mountain Meadow*

Bibliography

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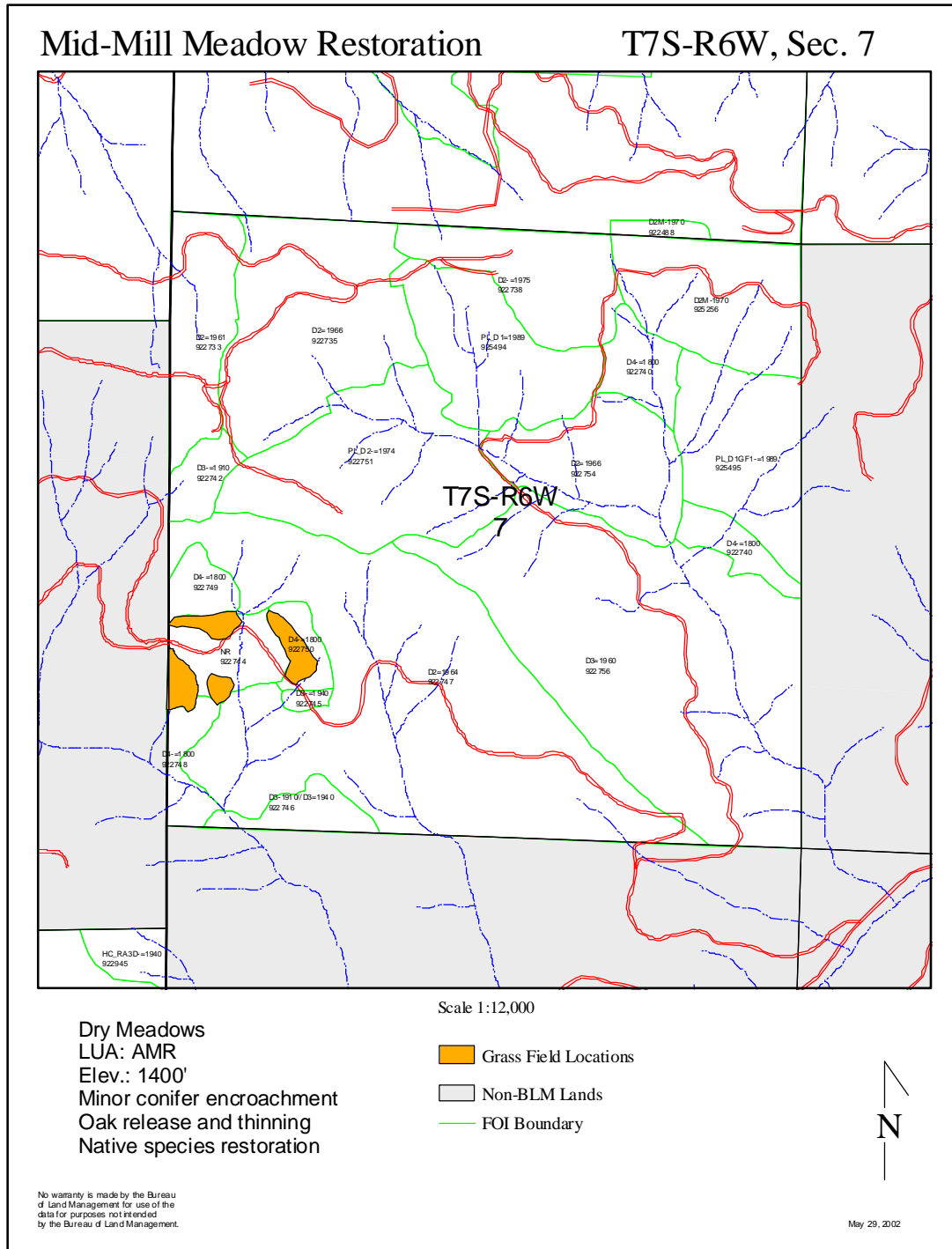
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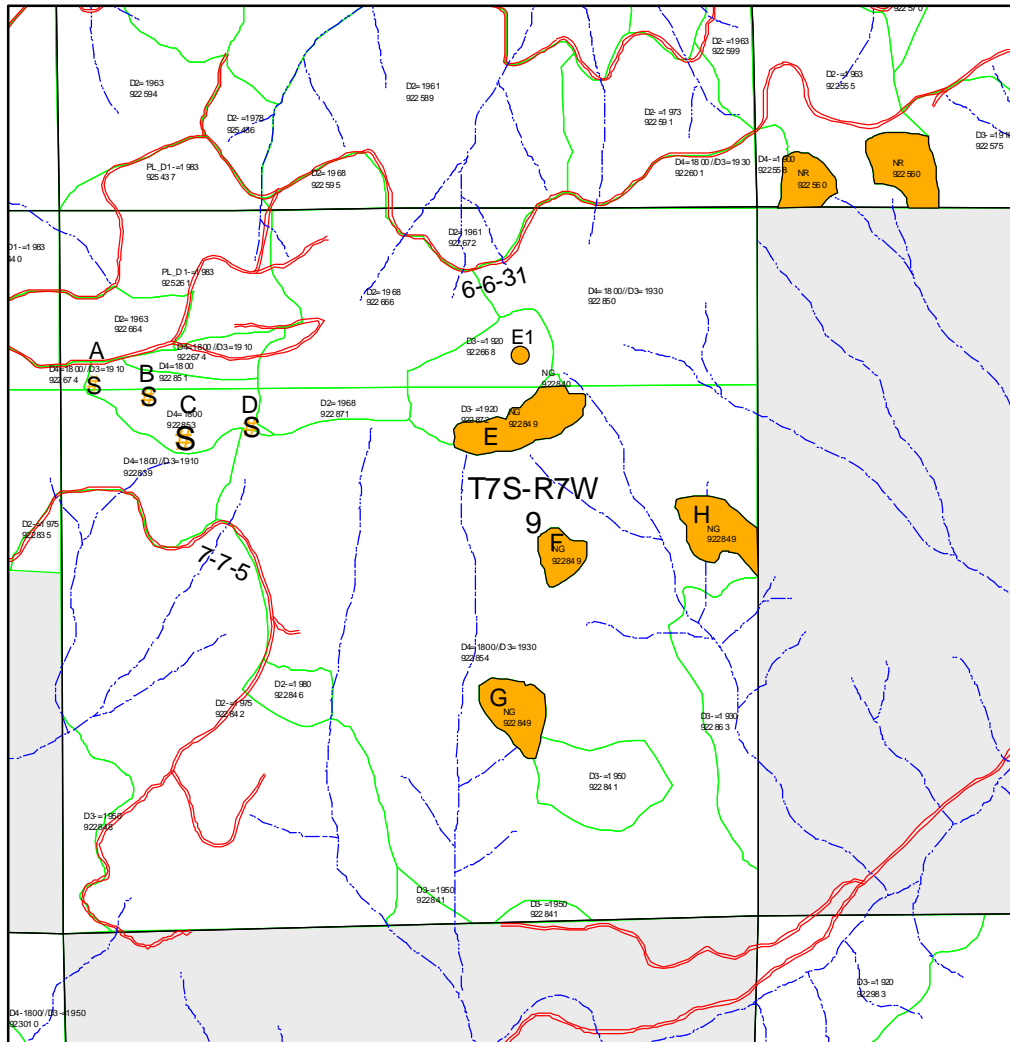
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Appendix 1: Project Area Maps



Upper Mill Meadow Restoration

T7S-R7W, Sec. 9



Scale 1:12,000

Dry Meadow/cliffs/rock gardens

LUA: AMR

Elev: 1600-2400'

Conifer encroachment

Native species restoration

Minor oak release

Grass Field Location

Non-BLM Lands

FOI Boundary

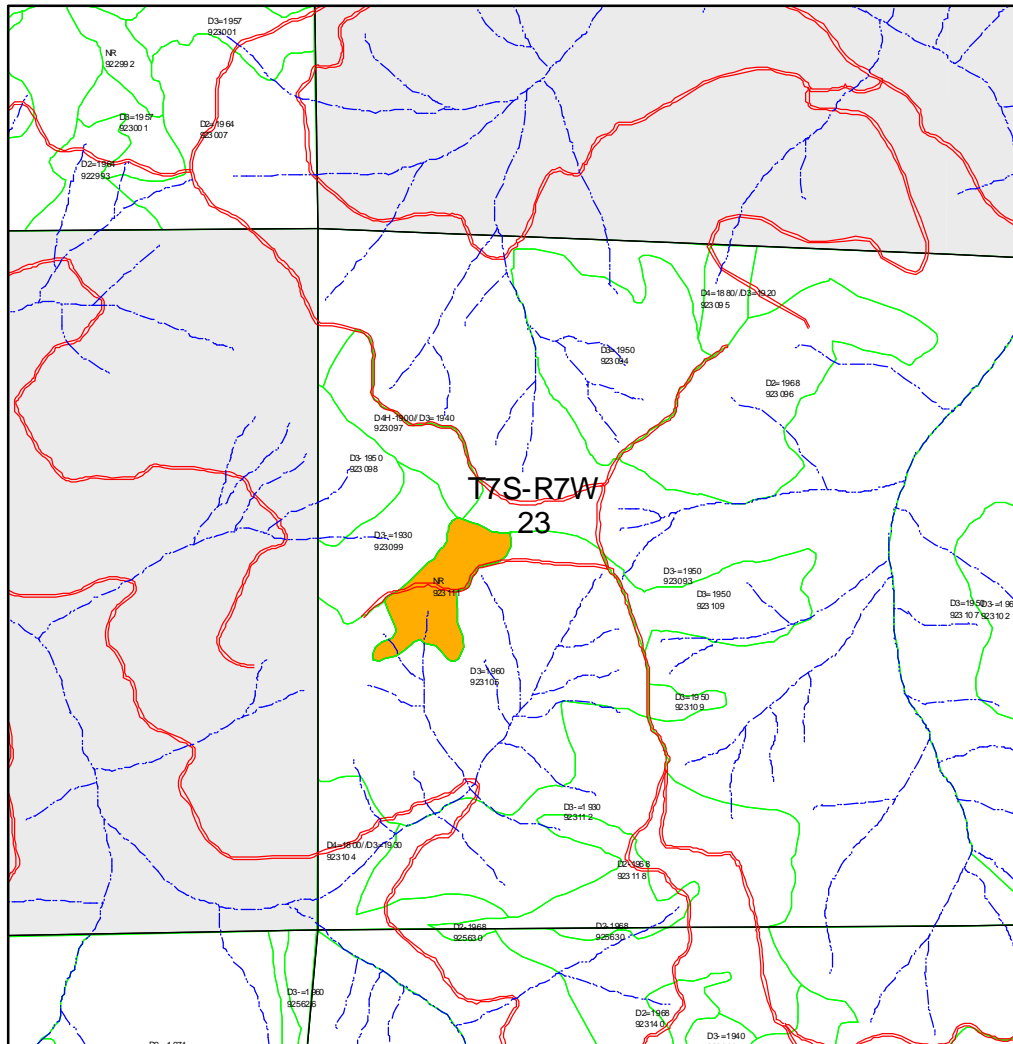


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May 29, 2002

Mill-Cedar Meadow Restoration

T7S-R7W, Sec. 23



Scale 1:12,000

- Streams
- Roads
- Township Lines
- Section Lines
- FOI Boundaries
- Non-BLM Lands
- Meadow

Dry Meadow/rock garden
LUA: AMR
Elev.: 2300'
Conifer encroachment
Native Species Restoration

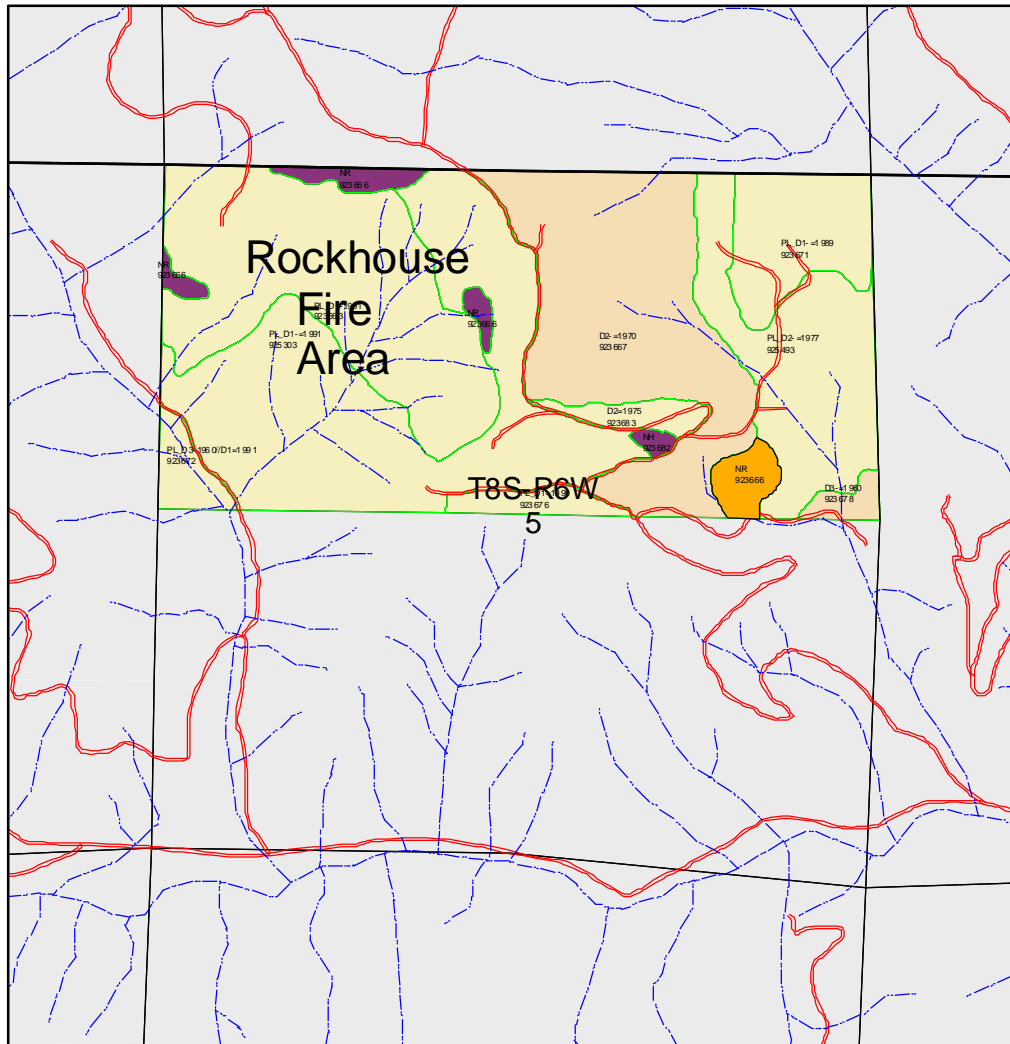
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March 14, 2003

Rickreall Meadow Restoration

T8S-R6W, Sec. 5



Scale 1:12,000

Dry Meadow

LUA: AMA

Elev. 1000'

Conifer encroachment

Oak release

Native species restoration

No warranty is made by the Bureau of Land Management for use of the data for purposes not intended by the Bureau of Land Management.

TEN-YEAR AGE CLASS (yrs)

0-20

30-50

60-80

90-110

120 - 190

200+

OTHER FEATURES

Non-BLM Lands

FOI Boundary

Meadow, in Rockhouse fire not proposed for restoration

Meadow



March 17, 2003

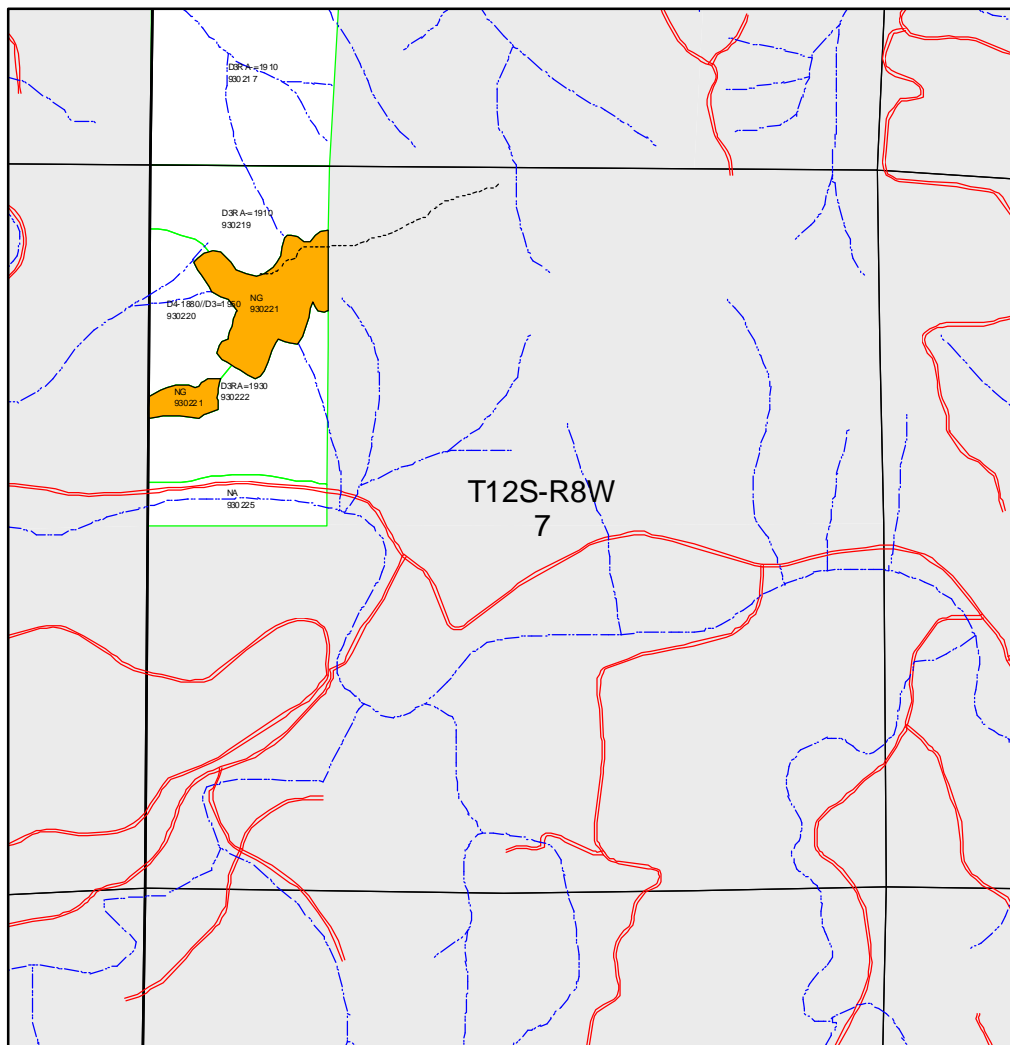
Mesic meadow
LUA: AMR
Elev.: 3200'
Noble fir zone
Conifer Encroachment
Native Species Restoration

$$\begin{array}{c} \text{N} \\ | \\ \text{N} \\ | \end{array}$$

May 29, 2002

Harlan Meadow Restoration

T12S-R8W, Sec. 7



Scale 1:12,000

Mesic Meadow
LUA: GFMA
conifer encroachment

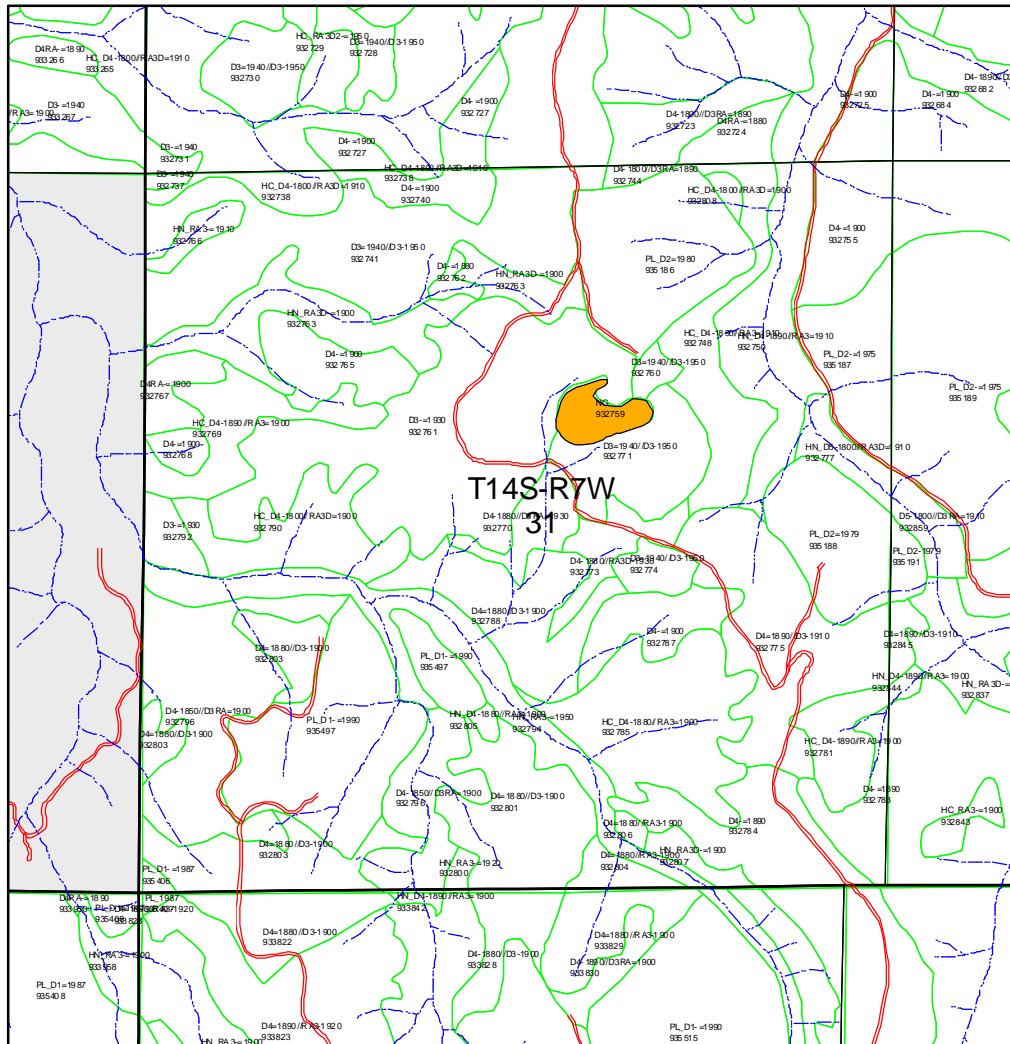
- Grass Field Location
- Non-BLM Lands
- FOI Boundary
- Horse/ATV Trail



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May 29, 2002

T14S-R7W, Sec. 31



Scale 1:12,000

Dry meadow
LUA: LSR
conifer encroachment
Oak/madrone fringe
Native species restoration

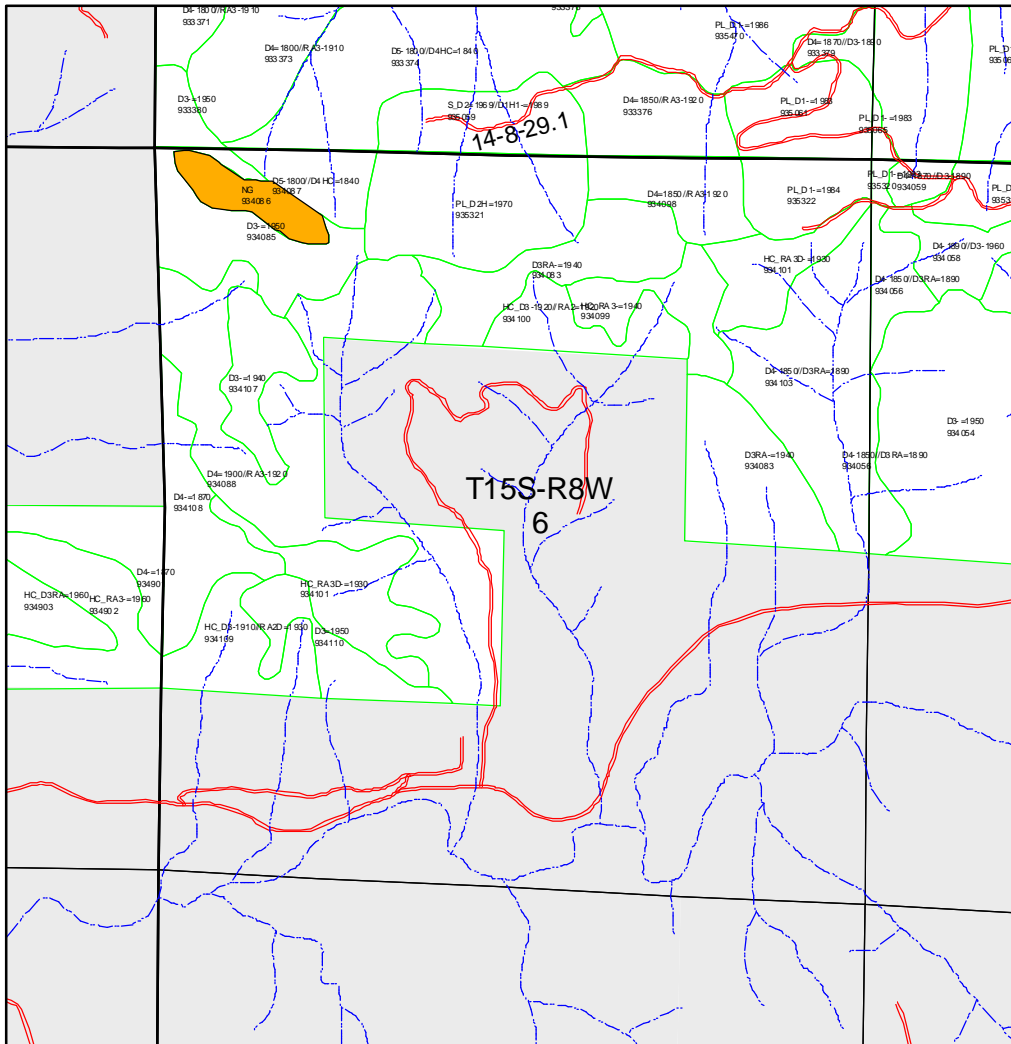
 Grass Field Location
 Non-BLM Lands
 FOI Boundary

No warranty is made by the Bureau of Land Management for use of the data for purposes not intended by the Bureau of Land Management.

May 29, 2002

Briar Creek Meadow Restoration

T15S-R8W, Sec. 6



Scale 1:12,000

Mesic meadow
LUA: LSR
Elev.: 1100'
Conifer encroachment
Native species restoration

Grass Field Location
Non-BLM Lands
FOI Boundary

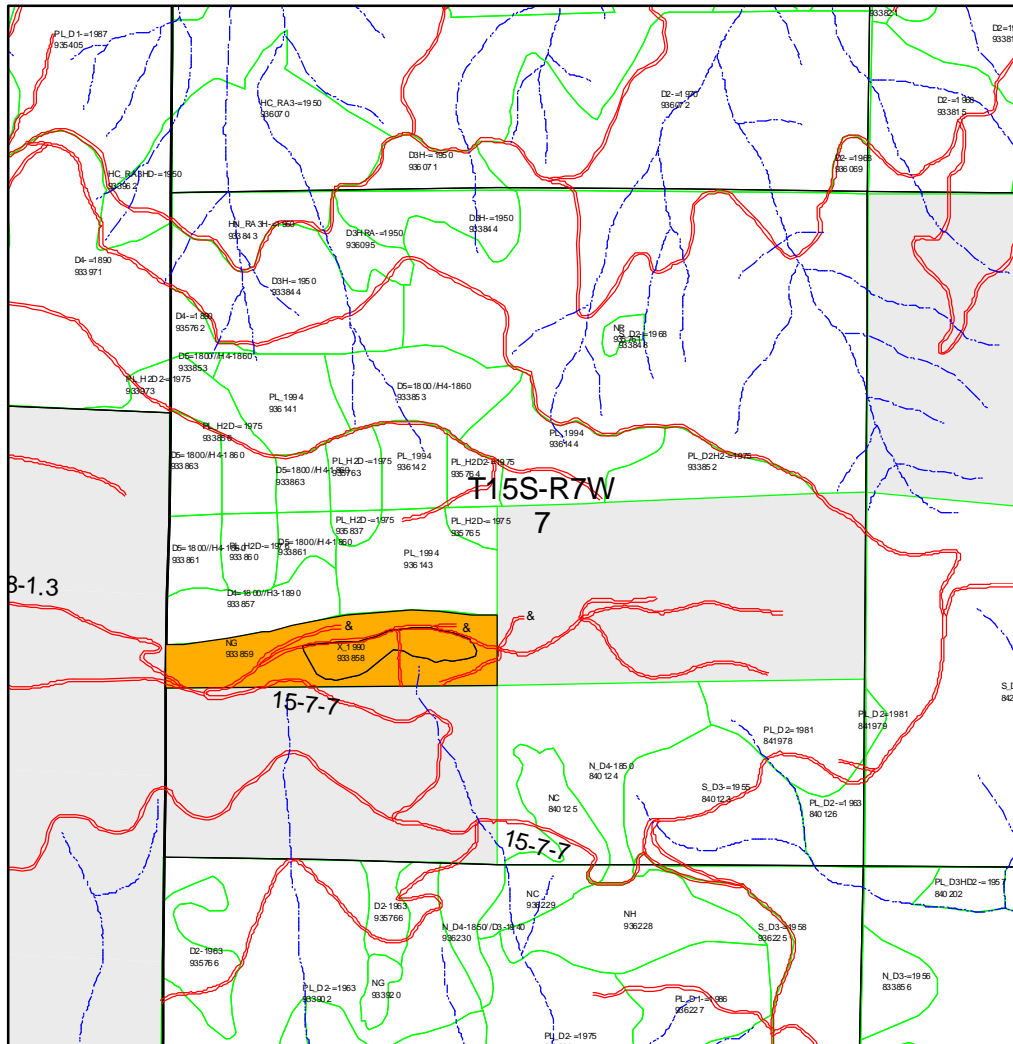


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May 29, 2002

Prairie Mtn. Meadow Restoration

T15S-R7W, Sec. 7



Scale 1:12,000

Mesic Meadow
LUA: LSR
Elev.: 3300'
Conifer encroachment
Native species restoration

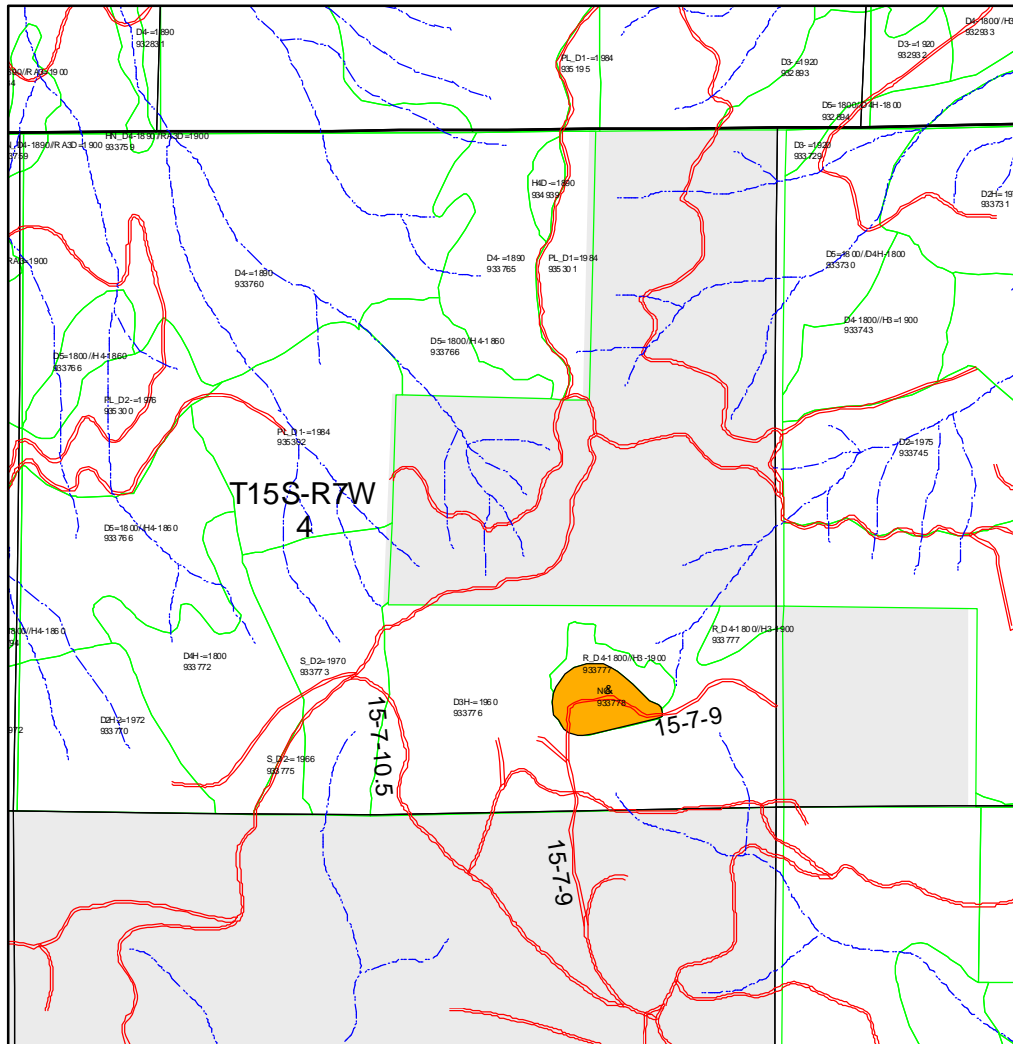
- Grass Field Location
- Non-BLM Lands
- FOI Boundary
- & Comm. tower/bldg.



No warranty is made by the Bureau of Land Management for use of the data for purposes not intended by the Bureau of Land Management.

May 28, 2002

East Prairie Mtn. Meadow Restoration T15S-R7W, Sec. 4



Scale 1:12,000

Mesic Meadow
LUA: LSR
Elevation: 3300'
Minor conifer encroachment
Native species restoration

- Grass Field Location
- Non-BLM Lands
- FOI Boundary
- Communications Bldg.



No warranty is made by the Bureau of Land Management for use of the data for purposes not intended by the Bureau of Land Management.

May 28, 2002

Appendix 2: Environmental Elements Review Summary

The following table summarizes environmental features the Bureau of Land Management is required by law or policy to consider in all Environmental Documentation (BLM Handbook H-1790-1, Appendix 5: Critical Elements of the Human Environment).

Critical Elements Of The Environment and Relevant Authority	Status: (i.e., Not Present , Not Affected, or Affected)	Remarks or Environmental Effects (if not affected – why) if Affected (summary of environmental effects)
Air Quality [The Clean Air Act (As amended)]	Affected	Pile burning and broadcast burning would be in compliance with Oregon Smoke Management Plan.
Areas of Critical Environmental Concern [Federal Land Policy and Management Act of 1976]	Not Present	No project sites within ACEC areas.
Cultural, Historic, Paleontological [National Historic Preservation Act (as amended)]	Not Present	Pre-disturbance survey will be conducted prior to line construction on Lower Mill Creek site.
Native American Religious Concerns [American Indian Religious Freedom Act of 1978]	Not Affected	
Threatened or Endangered Plant Species or Habitat [Endangered Species Act of 1973 (as amended) (ESA)]	Not Present	
Threatened or Endangered Wildlife Species or Habitat [ESA]	Affected	Plant surveys will be conducted prior to implementation. See <i>NEPA Impacts Analysis for Listed Terrestrial Wildlife Species</i> in EA Analysis File
Threatened or Endangered Fish Species or Habitat [ESA]	Not Present	. Sites are well above occurrence of listed species.
Prime or Unique Farm Lands [Surface Mining Control and Reclamation Act of 1977]	Not Present	
Flood Plains [E.O. 11988 (as amended) Floodplain Management 5/77]	Not Present	
Hazardous or Solid Wastes [Resource Conservation and Recovery Act of 1976, Comprehensive Environmental Response Compensation, and Liability Act of 1980 (as amended)]	Not Present	
Water Quality (Surface and Ground) [Safe Drinking Water Act as amended by the Clean Water Act of 1977]	Affected	See hydrology effects sec., Ch. IV.
Wetlands/Riparian Zones [E.O. 11990, Protection of Wetlands, 5/24/77]	Not Affected	
Wild and Scenic Rivers [Wild and Scenic Rivers Act (as amended)]	Not Present	
Wilderness [Wilderness Act of 1964]	Not Present	
Invasive, Nonnative Species [E.O. 13112, Invasive Species, 2/3/99]	Affected	See vegetation effects sec., Ch. IV.
Environmental Justice [E.O. 12898 - Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, 2/11/94]	Not Affected	
Adverse Impacts on the National Energy Policy (Executive Order [E.O.] 13212)	Not Affected	

Other Elements Of The Environment	Status: (i.e., Not Present , Not Affected, or list species or elements affected by this project)	Remarks or Environmental Effects (if not affected – why) if Affected (summary of environmental effects)
Land Uses (including mining claims, mineral leases, etc.)	Not Affected	
Minerals	Not Affected	
Recreation	Affected	See Effects Section, Ch. IV.
Soils	Affected	See Effects Section, Ch. IV.
Visual Resources	Affected	See Effects Section, Ch. IV.
Water Resources (including Aquatic Conservation Strategy Objectives, beneficial uses, etc.)	See water resources evaluation.	
Special Status and SEIS Special Attention Plant Species/Habitat (including Survey and Manage) (RMP pages 28-33, Appendix B-1:1- B-2:4)	Not known to be present	Does not meet survey protocol for S&M Species. Plant surveys will occur prior to implementation.
Special Status and SEIS Special Attention Wildlife Species/Habitat (including Survey and Manage) (RMP pages 28-33, Appendix B-1:1- B-2:4)	Not known to be present	See Effects Section, Ch. IV.
Fish Species with Bureau Status and Essential Fish Habitat	Not Affected	
Rural Interface Areas	Affected	See Ch. III and Ch. IV.
Coastal Zone (effect on “any land or water use or natural resource of the coastal zone”)	Affected	Proposed Action and alternatives consistent with the program objectives and goals.
Late successional and old growth species habitat and ecosystems	Not Affected	Meadow and early successional forest not associated with old-growth.
Special Areas (Within or Adjacent)	Affected	See Purpose and Need, Ch. 1
Biological diversity associated with native species and long term forest health	Affected	See Purpose and Need, Ch. 1

Aquatic Conservation Strategy Objectives Review Summary (RMP pages 5-6)		
ACS Objective	Does the project retard or prevent attainment of this ACS objective?	Remarks
1) Maintain and restore distribution, diversity, and complexity of watershed and landscape features to ensure protection of aquatic systems.	<u>No</u>	The purpose of this project is to restore a habitat type that contributes to landscape diversity.
2) Maintain and restore spatial connectivity between watersheds.	<u>No</u>	Project would increase connectivity of meadow habitat.
3) Maintain and restore physical integrity of the aquatic system including shorelines, banks and bottom configurations.	N/A	No activity would occur within stream channels or on stream banks.
4) Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems.	<u>No</u>	See hydrology discussion in effects section, Chapter IV.
5) Maintain and restore the sediment regime under which the system evolved.	<u>No</u>	Project would partially restore pre-settlement vegetation and disturbance regime. Sediment regime assumed to be closely linked. See soils and hydrology discussions in effects section.
6) Maintain and restore in-stream flows.	N/A	See hydrology discussion in effects section.
7) Maintain and restore the timing, variability, and duration of flood plain inundation and water table elevation in meadows and wetlands.	N/A	None of the meadows contain wetlands. Streams are steep headwaters with minimal to no flood plain development.
8) Maintain and restore the species composition and structural diversity of plant communities in riparian zones and wetlands to provide thermal regulation, nutrient filtering, and appropriate rates of bank erosion, channel migration and CWD accumulations.	N/A	No direct effects on riparian habitat or species expected. Plant communities will be partially restored to pre-settlement vegetation and disturbance regime.
9) Maintain and restore habitats to support well-distributed populations of native plant, invertebrate, and vertebrate riparian dependent species.	N/A	No direct effects on riparian habitat or species expected.

Downstream Beneficial Uses Review Summary (Salem FEIS 3-9)		
Downstream Beneficial Uses	Affected/ Not Affected/ N/A (not present within the project area)	Remarks
Public Water Supply	N/A	None in project area.
Private Domestic Water Supply	N/A	Domestic water supplies lower in watershed, see Appendix IV, Table III.
Irrigation	Not Affected	Project expected to have no effect on in-stream flows or irrigation. Sites listed on Appendix IV, Table III have downstream irrigation withdrawal.
Fisheries	N/A	No effect on downstream fish due to project intensity and locations.
Wildlife	Affected	Positive benefits expected for wildlife associated with meadow habitat. No effect expected for aquatic/riparian wildlife habitat.
Recreation	N/A	No water-related recreation in project areas.
Maintenance of Aesthetic Quality	N/A	No anticipated effects on aesthetic quality.

Appendix 3: Relationship of Alternatives to Relevant Management Direction

The following table shows how this action relates to required components of the Aquatic Conservation Strategy (*RMP*, pp. 5-7):

Component	Relationship to this Action
Interim Riparian Reserves	Watershed Analyses recommend the proposed management actions in the Riparian Reserves. Restoration of pre-settlement vegetation and disturbance regime is consistent with Aquatic Conservation Strategy objectives and with the direction to promote long-term ecological integrity (<i>RMP</i> p.14).
Key Watersheds	Upper Lobster Creek and Tobe Creek (catchment) are key watersheds containing project sites.
Watershed Analysis	Watershed Analyses completed for all watersheds containing project sites. This proposed action is consistent with recommendations in nearly all watershed analyses completed to date to inventory, maintain and restore special habitats.
Watershed Restoration	This was not designed as a watershed restoration project; it focuses primarily on restoration of an upland habitat. Direction from the Salem District Resource Management Plan to enhance and maintain biological diversity (P. 24), identify special habitats and protect their relevant values (P. 26), and maintain or restore habitat for special status wildlife species (P. 28) provide part of the purpose and need for this proposed action. However, it was designed to attain Aquatic Conservation Strategy objectives. Effects to resources described in the ACS objectives (stream physical integrity, water quality, sediment regime, in-stream flows, species composition, etc.) are addressed in the Environmental Consequences section of this EA.

Appendix 4: Hydrologic Information

Table 1. Project Sites by Watersheds.

Project Site	5th-Field Watershed	6th-Field Sub-watershed	7th-Field Catchment	Primary Stream (or tributaries to)
Lower Mill	Mill Creek	Lower Mill Creek	Upper Mill Creek	Mill Creek
Mid-Mill	Mill Creek	Upper Mill Creek	Lower Mill Cr.	Bear Creek
Upper Mill	Mill Creek	Upper Mill Creek	Lower Mill Cr.	Coldwater Cr.
Mill-Cedar	Mill Creek	Upper Mill Creek	Cedar Cr. / Lower Mill Cr.	Cedar Creek & Wind Creek
Rickreall	Rickreall Cr.	Upper Rickreall	Lower Rickreall	Rickreall Cr.
Monmouth Peak	Luckiamute Cr.	Upper Luckiamute	Upper Luckiamute	Lukiamute Cr.
Harlan	Big Elk Creek	Middle Big Elk	Elk Creek	Big Elk Cr.
Bummer	Upper Alsea	Lower S.F. Alsea	Upper Bummer & Tobe Cr.	Bummer Creek
East Prairie Mountain	Lake Creek / Upper Alsea	Upper Lake Cr. / Upper SF Alsea / Lower SF Alsea	unnamed / Coleman Creek / Rock Creek	Lake Creek / Coleman Cr. / Rock Creek
Prairie Mountain	Lobster Creek / Lake Creek	Upper Lobster / Upper Lake Creek	East Fork Lobster / unnamed	East Fork Lobster
Briar Creek	Lobster Creek	Lower Lobster	Upper Lobster / Little Lobster	Lobster Creek

Table 2. Proximity of Project Sites to 303d Listed Waterbodies.

Project Site	303d Listed Stream	Listing Boundaries	Listing Parameter	Approx. Distance From Project Site
Lower Mill	Mill Creek	Mouth to Headwaters	Bacteria, Temperature	<1 mile
Mid-Mill	Mill Creek	Mouth to Headwaters	Bacteria, Temperature	<1 mile
Upper Mill	Mill Creek	Mouth to Headwaters	Bacteria, Temperature	<1 mile
Mill-Cedar	Mill Creek	Mouth to Headwaters	Bacteria, Temperature	3 miles
Rickreall	Rickreall Creek	Mouth to Dallas/Mercer Reservoir	Flow, Temperature	<1 mile
Monmouth Peak	Luckiamute Creek	Mouth to Pedee Creek	Bacteria	2.5 miles
Harlan	Big Elk Creek	Mouth to Headwaters	Sedimentation, Habitat modification, Temperature	<1 mile
Prairie Mtn.	Lobster Creek	Mouth to Headwaters	Temperature	1 mile
Briar Creek	Little Lobster Creek	Mouth to Headwaters	Temperature	< 1 mile

Table 3. Beneficial Uses Associated with Streams in the Project Area.

Streams (Sub-watershed-6th field)	Beneficial Use of Surface Water	Approximate Distance from Project Areas
Mill Creek & tributaries (Lower Mill Creek / Upper Mill Creek)	Domestic use	1 mile
	Irrigation/live stock watering	1 mile
Rickreall Creek (Upper Rickreall)	Domestic use	3.5 mile
	Irrigation/live stock watering	< 1 mile
Luckiamute Creek (Upper Luckiamute)	Domestic use	>5 miles
	Irrigation/live stock watering	>5 miles
Big Elk Creek (Middle Big Elk)	Domestic use	>5 miles
	Irrigation/live stock watering	1 mile
Bummer Creek (Lower South Fork Alsea)	Domestic use	< 1 mile
	Irrigation/live stock watering	<1 mile
Lake Creek, Coleman Creek, Rock Creek (Upper Lake Creek, Upper SF Alsea, Lower SF Alsea)	Domestic use	>10 miles
	Irrigation/live stock watering	5 miles
East Fork Lobster (Upper Lobster Creek, Upper Lake Creek)	Domestic use	> 5 miles
	Irrigation/live stock watering	> 5 miles
Lobster Creek (Lower Lobster)	Domestic use	1 mile
	Irrigation/livestock watering	< 1 mile

Source: Water Rights Information System of the Oregon Department of Environmental Quality's Water Resources website.